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INFLUENCE OF EDUCATION

ON

DISEASES OF THE NERVOUS SYSTEM.



ON THE
INFLUENCE
OF
EDUCATION AND TRAINING
IN PREVENTING
DISEASES
OF THE
NERVOUS SYSTEM.

BY

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MDCCCLV.

" Education, in the most extensive sense of the word, may comprehend every preparation that is made in our youth for the sequel of our lives : and in this sense I use it."

PALEY.

1374

P R E F A C E.

THE composition of a treatise of design similar to the present has long been a cherished idea with the Author; and was suggested to him by his opportunities of observing the frequent connection between faulty education and nervous or mental disorders.

In these days of anxiety and competition, such disorders are greatly upon the increase; and it is the chief object of the following pages to show the existence, and the application, of certain moral and intellectual sanitary laws, which cannot be transgressed with impunity. These are, perhaps, even more important than the physical sanitary laws, towards which, of late years, the attention of the public has been so earnestly directed.

As originally planned, the volume was intended to contain, though in a more expanded form, only the third or concluding part of the present treatise; but it has

been thought advisable to write the first and second parts also, with a view to render the whole more intelligible and complete.

In carrying out this alteration, the standard works on physiology (more especially those of Dr. Carpenter) have been freely used; and the Author hopes, if any readers should become acquainted with these works through his quotations, that such knowledge may not end where it will begin.

The last few pages have been written in great haste, and under a press of business, after the earlier portions of the book were printed, and when the Author was on the point of leaving England. By the time these words are in type he will be on his way to the Crimea, hoping to assist in relieving the sufferings of the sick or wounded soldiery; and he trusts that all critics will deal gently with the absent.

PUTNEY;

March, 1855.

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PART I.

CHAPTER I.

THE STRUCTURE AND OPERATIONS OF THE NERVOUS SYSTEM.

THE Nervous System, as it exists in the higher animals, may be described as that part of their frame which brings them into relation with the external world; and by which their various members and organs are united in close and harmonious co-operation. To its instrumentality they are directly and entirely indebted for the powers of Sensation, Motion, and Thought; while, at the same time, it exerts a controlling or guiding influence over all those operations by which food is applied to the maintenance or growth of the fabric, and by which effete or noxious matters are cast off. In the fulfilment of its first-named and most essential offices, it is the source of those powers and faculties which create a broad distinction between the typical members of the animal and of the vegetable kingdoms: a distinction so familiar, that there is little need to dwell upon it here. But yet it may be pointed out that, in the plant, every branch or

portion is but a repetition of others, each perfectly capable, under favourable circumstances, of maintaining an independent existence when severed from the parent stem: of which it forms a part, not in consequence of the share that it contributes to the common weal, but by virtue of structural continuity alone. It is true that each branch augments the size of the tree in which it is bound up: but every one augments it in the same manner, and by the addition of the same materials. Hence, if one or more of these branches be removed, there is no loss to the others, and no constitutional disturbance to the tree: the only effect being the formation of a new and luxuriant growth in some other direction; for the purpose of consuming the sap which had been originally destined for the boughs taken away. In the animal, however, the case is widely different, the various organs being either dissimilar, or combined in pairs; and each of them, or each pair, having its special function, which cannot be performed, save partially and imperfectly, by any of the rest. These organs are connected together, structurally, by the remaining tissues of the body, after a manner analogous to the connection of the parts of a tree; but there is besides, a closer and more intimate union between them, in which the nerves alone are instrumental. From this arises that sympathy of distant organs which causes them to participate in the derangements or diseases of each other, even when in no way dependent upon the function that is arrested; and to suffer, indirectly, from all injurious changes, occurring in any part of the frame. This interdependence, and the three great

faculties already specified, must be regarded as results to whose attainment the nervous system is essential: a statement that does not apply to its influence over the processes of digestion and nutrition; which could certainly be performed without its interference, by the vital endowments of the organs immediately concerned in them. But here its control has been elegantly compared to the sway exercised by a rider over his horse; which, although it does not cause the movements of the animal, yet determines their speed, their regularity, and the periods of their commencement or cessation. In like manner the nervous system influences the operations referred to; and its connexion with them, although stopping short of causation, must be placed among the most important of its numerous offices in the body.

The apparatus by whose working these results are obtained, is formed, chiefly, by two kinds of tissue, presenting diversities of tint, at once apparent to the naked eye; and of minute structure, which require the aid of a microscope for their detection. They are distinguished, in consequence of the first, as the grey and the white; and in consequence of the second, as the granular and the tubular matter of the nervous system. These two elements are always found in close and intimate union with each other; but the exact method of their combination and arrangement varies considerably in different parts, and appears to be governed more by an economy of space, than by any principle connected with the proper performance of their operations. They are as distinct in their respective offices as in their colour and formation; the grey matter being the active

portion, and the seat of all those changes by which the functions of the nervous system are performed; while it is the province of the white portion to convey intelligence of these changes from one collection of the grey matter to others, or to the part of the frame where their final effects are to be produced: an arrangement bearing considerable resemblance to that of the electric telegraph; which consists, as is well known, of galvanic batteries, with wires uniting them, and serving to produce in one battery the action which the hand of man has excited in the other. Thus, the movement of the needle that is occasioned by the operator, say in London, is accompanied by the transmission of a force along the wire, which causes the same movement to take place also in Edinburgh, or elsewhere, in the corresponding needle of another dial. Precisely in a similar way (although by the power of a different agent) the changes worked in one portion of the grey matter of the nervous system, under the influence of external conditions, are carried on or propagated, through the white tissue, to other portions; upon which these external conditions cannot exert an immediate effect, any more than the telegraph clerk in London can alter the Edinburgh needle with his hand.

The distinction already made between the functions to which the nervous system is essential, and those to which it is only an important adjunct, points to a corresponding difference between the parts by which these functions are respectively performed. Accordingly, the powers of Sensation, Motion, and Thought, are found to reside in the portion denominated *cerebro-spinal*, that is, in the brain, the spinal

cord, and the nerves immediately proceeding from them; while the control of the processes of growth and nutrition is vested in another series of nerves, called the *sympathetic* or *ganglionic* system. The structure and operations of each of these great divisions will require to be briefly explained; and all notice of the second must be deferred until after the description of the first.

Before commencing an account of the organs by which these great powers are conferred, it may be remarked that two of them, namely, Sensation and Thought, are inherent in the nervous system itself, and might be exercised by it when standing alone, without the intervention of any other part of the body. But Motion, although excited by the nerves, is performed by the *Muscles*, and is but the expression of an influence exerted upon them. It is, therefore, necessary to preface a description of the nerves themselves, by a description of the instruments which they employ; and to devote a few lines to the essential characters of the muscular system.

A muscle is a bundle of fleshy fibres, lying parallel to each other, like sticks in a faggot; and firmly adherent, at each extremity, to bones or other points of attachment. These fibres are contractile, that is, they possess the power of shortening themselves; and, by the exercise of this power, their points of attachment are necessarily brought nearer together than before, so that, if a joint be placed between them, it will either be bent or straightened, accordingly as the muscle is situated with regard to it. For instance, there are muscles extending from the upper part of

the shoulder to the arm just below the elbow ; and those of them on the front of the limb bend the elbow by their contractions, while those on the back straighten it. These muscles may be felt to shorten themselves, whenever the action proper to either set is performed, and by their size and hardness the general energy of the muscular apparatus may be pretty fairly estimated. The various muscles constitute the whole bulk of lean flesh ; and in cooked meat, especially in that of young animals, such as veal and lamb, their fibrous character is distinctly apparent. They are the direct causes of all sensible movement, by virtue of the above-described contractility ; and they are divided into two great classes, one of which comprises those subject to the control of the will ; and the other, those independent of it. The former class furnishes the instruments of every act that is a subject of consciousness ; and the muscles included in it can be called into action only by an influence transmitted to them through the nerves. The latter is chiefly concerned in effecting certain internal movements, which commonly take place without our knowledge, and which, although they are liable to be influenced by the sympathetic nerves, are not positively known to be dependent upon them for their occurrence. To the former alone, therefore, will reference be made in connection with the brain and spinal cord ; and the latter, for the present, will be entirely disregarded.

The first great division of the nervous system consists of masses of grey and white tissue, contained within the cavity of the skull and of the back bone (and known technically as the nervous centres, or

commonly as the brain and spinal cord) ; and of slender branching filaments or *nerves*, which ramify extensively throughout the body ; and which are closely connected with the centres by one extremity. The nerves themselves are wholly composed of the white structure, and they serve a conducting office only, by supplying the means of communication between the nervous centres and the parts outside of them. For this purpose they are divided into two great classes, namely, the *afferent* nerves, which convey intelligence *to* the centres ; and the *efferent*, which bear back mandates *from* them. Each of these are arranged in bundles, or nervous trunks, for the convenience of packing, and for protection ; the trunk consisting of a number of minute filaments, which extend directly from the nervous centre to their outward destination, subdividing themselves, however, into smaller trunks, and, ultimately, into single filaments, before this destination is attained. The afferent filaments proceed for the most part from the skin, or from the organs of special sense,¹ to reach that centre within which they terminate ; and each of them, at its farther extremity, lies in contact with a minute portion of grey matter, whose

¹ The organs of special sense are the eyes, ears, nose and palate, each of which is susceptible of only one kind of impression ; and of one that has no other inlet to the brain. Thus the eye is the sole instrument of vision, while it is perfectly insensible to sound ; and the ear has a similar monopoly of hearing, although light produces no effect upon it. The word "special" is used in contradistinction to that general sensibility of the surface of the body, which is possessed in some degree by all its parts, and which enables them to take cognizance of a great variety of external changes.

changes it is the office of that filament to transmit. The efferent nerves take their origin in the nervous centres, and terminate, without the intervention of grey structure, by exceedingly minute loops in the substance of the muscles ; calling these organs into activity by virtue of a force which they convey, and which travels along the nerve until the looped extremity is attained.

The whole of the nerves, under ordinary circumstances, serve only, as has been said, to communicate between the nervous centres and their own extremities ; but there are conditions which permit an afferent nerve to convey to the centres, and an efferent nerve to the muscle in which it terminates, some impression that has been made upon it in its course. But then, in the case of the afferent nerve, the impression is always referred to, or supposed to come from, the extremity. This is well shewn by pressure upon what is called the “funny bone ;” that is, upon the ulnar nerve as it passes over the bone of the arm by the elbow joint. The nerve terminates by several branches in the little finger, and on the inner side of the ring finger ; and to these parts the pain produced by pinching it at the elbow is referred ; that is, in these parts it is said to be felt. It is also a matter of common observation, that persons whose limbs have been removed by the surgeon, still experience sensations as if in the missing members. A few years ago, when veterans with wooden legs were more common than a long period of peace permits them to be now,¹

¹ Written in 1853.

they might constantly be heard to complain of pains in the feet which they had left behind them in an engagement : pains that must have been due to pressure or other causes acting upon the truncated nerve of the stump ; but which, like every change that nerve could convey, was felt as if proceeding from the parts in which its missing extremity had once terminated. An efferent nerve, if hurt or irritated in its course, calls the muscles dependent upon it into activity, just as if an impulse had been conveyed along it from the centres ; but such an occurrence is so rare, except as a consequence of experiment or accident, that it may be altogether disregarded in a brief description like the present.

The nervous centres consist of four distinct series or sets of organs, called respectively the *Cerebrum*, the *Sensorium*, the *Cerebellum*, and the Spinal Cord. The whole of the first three series, and the upper portion of the cord, are contained within the skull ; the rest of the cord within the cavity formed by the back bones. The centres consist in great part of grey matter (the essential of each in its individual capacity), surrounded by, or including, white tissue, which serves to maintain close union and constant communication between them.

The *Cerebrum*, or (as it will hereafter be styled in these pages) the Brain, forms the crowning portion of the nervous apparatus, and by its high development in mankind, places a mental barrier between the human race and the lower animals ; as complete as that furnished by the hand in point of physical structure. It supplies the material instrument of the Will ; and is the seat of all the intellectual operations, as

Thought, Memory, Imagination, Judgment, and the like. It neither receives nor transmits nerves; but is intimately united with the Sensorium, upon which it is dependent for all the stimuli that call it into activity, and also for its power to react upon the body. This much being first stated, a more minute description of its powers and offices must be deferred until the relations of the several centres to each other, and to the nerves connected with them, have been clearly laid down and explained.

The *Sensorium*, coming next in order of position, and placed between the base of the brain and the summit of the cord, has received its name from being the seat or instrument of all sensation. Of this compound body, one portion ministers to the sense of vision, another to the sense of hearing, and another to the sense of smell. To one of its divisions we are indebted for that general sensibility of the surface from which we derive all ideas of contact or temperature, and all impressions of physical pain. Through another we become acquainted with, or *feel*, the operations of the mind, which, as will be seen hereafter, do not necessarily involve a consciousness of themselves; but may, on the contrary, be perfectly performed without our knowledge. The sensorium receives, also, the afferent nerves from the organs of special sense; and is connected, by its tubular tissue, both with the brain and the cord; but, as no efferent nerves proceed from it, it has no direct outward communication with other parts of the frame.

The *Cerebellum*, or *Little Brain*, is chiefly employed in the regulation and direction of motor impulses, so

as to ensure the accomplishment of any desired action, by calling the proper muscles, and no others, into play. Its function may be regarded as a matter of detail rather than of principle; and will admit of being explained more clearly in the sequel.

The *Spinal Cord* is concerned solely in the production of *motion*; and into it are inserted all the afferent and efferent nerves of the body, excepting only those of the former class which proceed from the organs of special sense, and which have been already said to terminate in the sensorium. Like the sensorium, the cord must be regarded as consisting of segments or portions; each of which possesses a power of independent action, receiving and giving forth afferent and efferent nerves; but which are continuous in point of structure, and capable of free communication with each other.

The typical mode of activity of the complicated apparatus whose chief divisions have been thus enumerated, may be described as follows: the independent action of one segment of the spinal cord being selected as an illustration. Some external object or circumstance alters the condition of the grey matter at the extremity of an afferent nerve, producing an effect which is technically called an "impression." This impression is conveyed by the nerve to the grey matter of the centre in which it terminates, where a second effect, technically called a "change," is produced. The change in the centre is then conveyed back, or *reflected*, along the afferent nerve proper to the part in which it took place, to some muscle or muscles, which are called into action by its influence.

In the above description there are two things especially worthy of notice: first, that it does not involve any idea either of sensation, intelligence, or will, on the part of the animal; and, secondly, that we are compelled to recognize the manifestation of a *power* or *force*, which expends itself in producing movement. It is necessary to add, that the whole process may be accomplished with extreme, or almost inconceivable, velocity.¹

With regard to the absence of sensation, intelligence, and will, it may at once be stated that the ideal of nervous activity, as taken from an extended survey of animated nature, is, that it should be automatic or instinctive in its character; that is, that each link in the chain of operations should follow as the inevitable result of the one preceding it; and that all of them should take place in consequence of "laws written upon the nervous pulp."

Hence, if we look only to those actions necessary to the preservation of animal life, the spinal cord and its nerves must be regarded as the essentials of the nervous system; because all the simple movements addressed to this purpose, are performed through its agency. But the function of the cord is to excite motion only, and, therefore, the actions in which it alone is concerned, cannot be controlled by the will; and are not attended by sensation. The act of swallowing may be taken as a perfect example of them. It is accomplished by the contraction of a muscular tube, which extends from the mouth to the stomach,

¹ See note, p. 55.

and which gradually forces the morsel downwards. This contraction, as far as the upper part of the tube is concerned, is a consequence of the impression made by the contact of food with the afferent nerves that ramify upon its surface; which impression, being carried by them to the cord, produces the change; and this, reflected, produces the movement. The complete act of swallowing occupies some little time; but it is not attended by sensation, for we cannot trace the downward progress of the morsel; and, unless it be very hot, we neither feel nor taste it after it has left the palate. The act is quite involuntary, for when that which is swallowed once reaches the extremity of the afferent nerves going to the cord, the will cannot arrest it, either there or afterwards; and that it is not dependent upon gravity, or the slipping down of the food by its own weight, is proved by watching a horse while drinking from water at the level of the ground, when it may be seen to swallow upwards.

There are some other spinal actions, of a strictly analogous character, that may be readily perceived by observation either of ourselves or others. The most remarkable of them is the expansion of the chest in breathing, which is excited by an impression made on the extremities of an afferent nerve in the lungs.¹

¹ An ingenious attempt has lately been made by Mr. Lowndes, to show that the afferent nerve of respiration is really situated in the throat, and that the *contact of air* is its proper stimulus. He is of opinion that the sensation of distress arising from want of breath, is due to an impression conveyed from the lungs; just as the sensation of hunger seems to be dependent upon an impression upon the afferent nerves of the stomach; but that the ordinary

The impression appears to depend upon the chemical state of the blood; but neither this itself, nor the movements which result from it, are sufficient to produce a sensation, unless the attention be specially directed to them, or unless the breathing be in some way quickened or impeded. Another illustration may be taken from that winking of the eyelids which is performed unconsciously by all persons at short intervals of time; and which cannot be prevented, for more than a few seconds, by any effort of the will. Here the impression is caused by minute particles of dust floating in the air, and striking upon, or adhering to, the surface of the eye; or even by the drying up of the moisture by which that surface is protected. The impression being made, is conveyed to the cord, and occasions a motive power to be reflected, in the manner that has already been described.

But purely spinal movements, even in those actions most essential to life, are not common in the human species; not because the cord is insufficient for their accomplishment, but because it acts as an afferent

stimulus to the act of breathing, as to the act of swallowing, is carried from the throat. On this principle Mr. Lowndes explains the occurrence of death from the use of chloroform, which has always happened, when happening at all, just after the commencement of the inhaling process. He thinks that the afferent nerve of respiration is rendered suddenly torpid, by the contact of chloroform vapour not sufficiently diluted by air; and that the breathing is consequently stopped. If this view be correct, as there is much reason to believe and hope, the sole danger attendant upon chloroform will be obviated by proper care during the first few minutes of its administration.

nerve to the sensorium, and thus causes this organ to participate in its operations.

The manner in which this participation is effected, and in which it modifies the action of the cord, will be best explained by laying down the general law that governs the relations of the nervous centres to each other, and to the nerves connected with them. These relations, when fully understood, will be found to furnish a key to the comprehension of many obscure mental conditions, and to clear up completely the seeming incongruity between an instinctive apparatus, in itself perfect and complete, and a will, by which this apparatus may be subjected to occasional or habitual control. The principle is in itself extremely simple, but the true appreciation of it must be regarded as one of the most important of modern advances in physiology, because formerly—from the improper application of the laws of human volition and intelligence to the interpretation of instinctive actions, whether performed by man or by the lower animals; and from the fallacious analogies to which this application gave rise—many parts of the science of the nervous system were shrouded by a haze of mysticism and obscurity, that still exists in the imagination of too many persons, who, although otherwise well informed, turn a deaf ear to the researches of philosophy; while they yield ready attention and implicit credence to the pseudo-miracles of the mesmeriser, or the unintelligible jargon of the phrenologist.

In the first place it may be stated that, when an impression is conveyed by an afferent nerve to the

portion of the central mass in which it terminates (that is, either to the cord or the sensorium), its natural tendency is still to travel upwards, to the portion or portions above; its *ultimate* change not being produced until its upward course is arrested, and, therefore, not in the centre or centres which it traverses by the way. For instance, if the foot of a healthy person be tickled with a feather, the impression is conveyed, by a nerve proceeding from the part, to the spinal cord; but instead of resting there, it passes through the sensorium, so that the tickling is *felt*, and on to the brain, where it produces a *change*, that is, an *idea*, as to the nature and cause of the sensation, and a *determination*, either to withdraw the foot, to leave it still, or to forbid the continuance of the irritation. Again, if the impression be first conveyed to the sensorium, as by the nerve of sight, from an object lying in the footpath, it passes on to the brain, and occasions as before, an idea of the nature of the obstacle; and an act of judgment and of will with regard to the best method of meeting or avoiding it.

But if the impression be by any means prevented from thus passing on through the nervous centres, it will produce its ultimate change in the highest centre that it can reach—in the sensorium, if it cannot reach the brain; in the spinal-cord, if it cannot reach the sensorium. And, as an impression, in traversing any centre, produces a certain effect there, although not the full effect of which it is capable (the tickling being *felt*, for example, as the impression made by the feather passes through the sensorium to the brain), it is easy

to conceive that a portion of its original strength and intensity must be expended in this way, before it reaches its final goal. Such is found to be the case; for the farther the impression is conveyed, the less marked will be the change which it produces at last; or, in other words, a given impression will react more powerfully through the lower centres, if their communication with those above them be impeded or cut off, than it would have done through the brain, if this communication had been free.

The nature of the ultimate change varies with the part in which it is produced. In the cord, it would appear to consist solely in a disengagement of motive force, by which many actions of vital importance to the economy are performed with unerring certainty; and not only without our voluntary interference, but even without our knowledge, unless when this is gained by special observation. In the sensorium, regarding it as a whole, the same disengagement of force takes place, and accomplishes movements in the same way; but there is, besides, an additional and special effect produced, the character of which is different, in the different parts or sub-divisions of the organ. It has received the general name of *sensation*, and, when taking place in the optic lobe, is known as vision; when in the auditory lobe, as sound; and so on. The sensorium is remarkable for the strict division of labour between its parts, each of them being only susceptible to one kind of impression; and, moreover, the sensation proper to each being excited by all variations in its condition, whether caused or not by impressions of the class to which it was intended to respond. Thus,

a blow upon the head, by altering the condition of the optic lobe, will often appear to produce a flash of light ; and fulness of the vessels of the sensorium will produce the effect of sound, as of singing or rushing noises in the ear. Such fallacious sensations, originating entirely in the perceptive organ itself, are termed *subjective* (in contradistinction to the ordinary ones, which, following upon the impression caused by some external *object*, are known as *objective* sensations), and they will hereafter be referred to as explanatory of some very curious morbid conditions.

When the ultimate change is deferred until the impression reaches the brain, it assumes a more complex character, and is made manifest in three distinct methods. The first of these is by the formation of an *idea*, which may be superficially described as a *cerebral sensation*. The second is by the disengagement of force, purely automatic or instinctive, associated with the idea, as sensorial force is with a sensation ; and, like it, producing *involuntary* action. The third is by a force of a totally different character, and probably peculiar to the human race. This is the force of *volition*, or will ; which has, when exerted, power to keep down the instinctive force, and to suppress all its operations. It is, therefore, expended either in producing voluntary, or in restraining involuntary movements ; and, with regard to both these modes of exercise, it will again be noticed in the proper place.

The upward course of an impression having been traced to the farthest possible point,—namely, to the working of its ultimate change in the brain,—it will

next be required to reverse the process, and to follow the change downwards, on its way to react upon the body. Passing though the sensorium, the idea is *felt*, and we are thus made acquainted with its existence; while the force goes on to the cord, and, acting by the instrumentality of its efferent nerves, either calls the muscles into activity, or, if it be volitional force, perhaps keeps them at rest. If the ultimate change take place in the sensorium, the motive force still has to pass to the cord in order to show itself; while the former organ feels a sensation, but does not become acquainted with an idea. If in the cord, then the development and exercise of motive force, without either an idea or a sensation, forms the sum total of the necessary result.

It will perhaps serve to render more clear the manner in which the operations dependent upon these changes are performed, if an endeavour be made to furnish some account of their rationale, and of the purposes which they respectively fulfil in the scheme of Divine Providence; so far as this can be unravelled by scientific investigations, or comprehended by finite minds. And (premising that the spinal and sensorial systems are found in a high state of development in insects; but that the brain, gradually added in ascending the animal scale, although well marked in the higher quadrupeds, attains perfection only in mankind,) it will be shown that the cord ministers mainly to the safety, and the sensorium to the pleasure, of the animal: while the brain, by acting *instinctively* upon *ideas*, gives or increases the faculty of adaptiveness to varying external circumstances; and, by furnishing

volitional power, supplies the conditions necessary to moral responsibility.

It is plainly essential to the continued existence of all animals, that they should perform certain movements: for the aeration of their circulating fluids; for the capture of their prey; for their flight or concealment from danger; and for the fulfilment of various other purposes in their economy. This necessity is perfectly provided for by the working of the spinal system; because the circumstances which require motion on the part of the animal, are those which produce an impression on the extremities of the afferent nerves, and ultimately cause the development of a force in the centre, which immediately discharges or expends itself in the accomplishment of the necessary act. Thus, the presence in the throat of food to be swallowed, and the presence of impure blood in the lungs, are the immediate and unerring excitants of the operations which such circumstances respectively demand; and the force concerned being instinctive, and not volitional, leaves no room for neglect on the part of the animal, who might otherwise be choked by forgetting to swallow, or suffocated by forgetting to breathe.

A large portion of the actions of insects, and especially their actions of progression, are, for the most part, spinal; and it is evident that the mechanism described in the last paragraph would be adequate to the accomplishment of all they do. But, if possessed only of a spinal system, although they might retain their present habits, they would have no enjoyment of existence, and would resemble machines, in every-

thing but in containing a motive power within themselves. They are elevated to the condition of sentient beings by the sensorium, an organ that may be typically described as a modification of the cord, in which the changes are attended by sensation; so that a certain range of impressions produces feeling simultaneously with movement. Of necessity, this feeling must be either pleasurable or painful, and therefore the sensorium both confers the power of enjoyment, and, at the same time, entails the liability to suffering.

In this way, by the motive power of the cord, and the simple feeling of the sensorium, the habits of each insect are prompted, and its necessities are provided for. But its actions, in the absence of a brain, are blindly instinctive; being in no degree under the control of will, guided by no idea of a purpose, and incapable of being modified to meet external circumstances foreign to those in which the individual is commonly placed by nature. Hence, the range of action and the power of adaptiveness possessed by insects are both extremely limited. The bee constructs its wonderful cell, the spider of each variety weaves its characteristic web, with no knowledge of the purposes to be answered by the work; but in passive obedience to external stimuli, and by virtue of a law of its conformation which cannot be violated: these actions being performed as certainly under artificial circumstances which render them utterly unavailing, as they would be by the insects in a state of nature.

Ascending the animal scale, from insects, through fishes and reptiles, to the birds and quadrupeds, we find the brain added on to the cord and the sensorium,

and gradually enlarging as we rise. We find, also, as soon as the brain attains a size and development sufficient to endow it with functional activity, that the animal becomes possessed of a power to shape and modify its conduct according to the exigencies of its position; no longer doing always exactly the same thing, but displaying faculties seemingly analogous to the cunning or contrivance of the human species. This result is obtained by the passing on of the impression, through the sensorium, to the brain; where it excites an idea, and occasions, also, a disengagement of force, which, just as if sensorial, expends itself in producing motion. A trout, having been wounded by a hook, will shun the bait afterwards; an idea of that object, in connection with the injury it has sustained, overcoming the merely sensorial impression given by the sight of food. The resulting action is instinctive, and perfectly involuntary; but it is prompted by a kind of knowledge, and not by mere feeling. In a still higher grade of being, the impression may probably suggest a *train* of ideas, following each other in obedience to the law of association, and not producing movement until some final idea is arrived at. Then, as the mental process can be carried no farther, the involuntary reasoning is followed by an instinctive act, frequently very different from that which would have succeeded to the original sensation. Hence the educability of the lower animals. A perfectly untaught dog, seeing food upon a table, would have only one idea excited by the visual sensation; and the force developed with this idea would instantly expend itself in an endeavour to obtain the prize. But if the dog had been punished

for stealing, an idea of suffering would be associated with that of the indulgence to which it was tempted; and, if the punishment had been sufficiently severe or frequent, this last idea would overpower the former, and the animal would instinctively avoid a repetition of the fault. If it were a clever dog,—that is, one having a large and active brain,—it would, perhaps, associate punishment, not with theft as such, but only with detected theft; and then its final idea would be determined chiefly by the presence or absence of witnesses. But, in either case, the process in the brain of the dog differs widely from volitional thinking; because its ideas follow one another in spontaneous or uncontrolled succession, and do not result in movement until the associations of the first have been exhausted. The animal has no power to balance two courses of action, and to decide between them; but the idea that ultimately predominates in its mind will be the one that directs its conduct. Many animals, and especially the dog, will go through a complicated process of reasoning, and then act upon it; but their reasoning is the unsolicited and involuntary working of the brain; and their acts are expressions of this working, which they are unable either to restrain or modify: their behaviour, as a rule, being the same that, under similar circumstances, has formerly been most to their advantage. For, of the various ideas which may be recalled to a dog by the sight of unprotected food, that one will be recalled most vividly, which has been most frequently and most forcibly impressed upon it. Thus, if it has been occasionally punished for stealing, but has

more frequently escaped unhurt, the idea of gratification is likely to overpower the idea of suffering, and *vice versa*; the effect being that the brute, with no moral responsibility, is compelled, by the laws of its organism, to act in conformity with the teachings of its experience.

The power of volition, by which mankind are rendered free and accountable agents, may be exercised in a two-fold manner; and firstly, in retaining certain ideas before the consciousness, so as to give them preponderance over others, which, in the natural course of events, would have succeeded to them and swept them away. Instead of being a machine for the performance of that instinctive or spontaneous succession of ideas which has been described as characteristic of brute reasoning, and which occurs, also, during human dreaming, the waking man is able to control the current of his thoughts, by arresting their course at any given point, and by making any one of them the centre of fresh associations. Thus, among two or more classes of ideas, rapidly resulting from the same impression, he is able to determine, by a distinct effort, which shall rest upon his mind, and ultimately guide his conduct. For instance, a person receiving an injury may determinately dwell, either upon ideas of hatred and revenge, or of charity and forgiveness; either upon his desire to retaliate, or upon his fear of the consequences which retaliation might entail. The opposite classes of ideas would necessarily lead on to opposite courses of action; and although it is true that the habitual direction of the thoughts would, in any case, render it more easy to dwell upon one class than upon the other; yet

every man either possesses, or once possessed, the power of selection between them ; and is not, like the brute, entirely dependent upon the relative intensity of the experiences connected with each. The lion, in his native deserts, accustomed to conquer, is rendered combative by success ; and has acquired no ideas to prevent him from springing upon an assailant. In the cage of a menagerie, where he has been lashed into submission, the ideas gained by experience of torture are those with which he is most familiar ; and thus, submission becomes an engrafted law of his nature, against which he has no power to struggle. But the human slave may disregard or forget the whip and the fetters, during the volitional fixation of his mind upon thoughts of freedom or of retribution ; and hence it is, that, while the subjugation of the brute to man may always be confidently reckoned upon, the subjugation of man to his fellow can never be foretold with certainty. The dominant ideas of the brute are the expressions of his past experiences ; but the dominant ideas of man are selected by a power that is superior to any external influence ; so long, at least, as its possessor will remain faithful to himself.

The second method in which the power of volition may be exercised, is by the production of movement ; as whenever we intentionally perform any bodily act. The characters by which such acts are distinguished from the instinctive ones, and the circumstances under which they are commonly witnessed, will be noticed hereafter, when describing, with more minuteness, the operations of the human brain. Before doing so, it will be desirable to return to the inferior portions

of the nervous system; and to observe their conditions of activity, both when separate, and in combination.

For this purpose it is necessary to premise that, although the three great divisions of the nervous centres are, in man, very intimately connected, yet, under certain circumstances, a partial or complete severance may be effected between them; and, notwithstanding this, they will each retain the full power of performing their special offices. It often happens that a small portion of the spinal cord is disabled by disease or accident; and then, all parts of the body whose afferent nerves enter the cord below the seat of injury, are said to be paralysed; that is, they have lost the power of sensation, and can no longer be moved in obedience to the will. The explanation of this state is, that the affected parts of the cord can no longer transmit impressions from below; so that there is no channel by which they may reach the sensorium; neither can it transmit volitional or instinctive force from above; so that these powers are arrested in their downward progress. But, if the lower portion of the cord have escaped unhurt, and if the patient survive the first shock of the injury, this lower portion will begin to display its independent action, by the development of motive power in direct response to impressions. If the foot be lightly tickled, the impression, stopped before it reaches the sensorium, can react only through the cord itself; and it will often do so with great energy, the whole leg being raised from the bed, and thrown into active or even violent movements: of which the patient will remain entirely

unconscious, as if they were performed by the limb of another person; provided only that he be prevented from seeing them, either by the interposition of a screen, or by the employment of his attention upon indifferent matters.

The independent action of the spinal cord is often excited in the healthy subject; in consequence of the sensorium speedily becoming blunted to an impression that is frequently repeated. The act of breathing has been already cited as an instance of spinal movement, resulting from an impression made upon the afferent nerves of the lung, by the contact of the unpurified blood. The familiarity of the impression prevents it from calling the sensorium into activity; and therefore its ultimate change is produced in the cord; neither the impression itself, nor the action which follows it, being felt under ordinary circumstances. But if the character of the impression be in the slightest degree changed, or if it be rendered more intense, it immediately rouses the sensorium; and a painful feeling is experienced. The utility of this arrangement will at once be obvious. If the act of breathing were always felt, it would interfere with many bodily and mental processes, more especially, perhaps, with sleep. And, on the other hand, if it were not felt when impeded, abstracted persons, or sleepers, would be constantly liable to suffocation from accidental circumstances. In like manner, the constant winking already mentioned, is produced by a slight impression upon the eye, frequently recurring, and to which the sensorium is inattentive. But if a similar, though more intense impression, be caused by a particle of dust

which the closing eyelid cannot wipe away, then sensation is instantly excited, and other efforts are made for its removal.

The sensorium may also be so much occupied by impressions conveyed through its special afferent nerves, as to neglect those coming through the spine; unless they are in some way remarkable. A pedestrian, whose eye is arrested by a distant object, will often gaze fixedly upon it: continuing his walk the while; but entirely by the agency of the cord, the sensorium and the brain being busy about other things. In such cases, the contact of the foot with the ground constantly produces the next step; and progression may be performed in this manner, until either a change in the surface trodden upon affects the sensorium by its novelty; or until the distant object ceases to attract; or until the unguided footsteps are arrested, by a fall into a ditch, or a collision with a passenger.¹

¹ There is a familiar anecdote of Sir J. Thornhill, the painter, and father-in-law to Hogarth, that well illustrates the occurrence of *spinal walking*. He was painting the interior of the dome of St. Paul's; and when walking backwards along his platform, in order to observe the effect of the picture from a distance, he went so close to the edge, that another step would have precipitated him upon the pavement below. He was about to take this step, when a bystander saved his life, by seizing a brush as if to smear the painting; thus causing the artist to spring forward, and to learn, when sufficiently safe to be told of it, the imminent danger from which he had so narrowly escaped. In this case, the will had commenced the walk backwards, and the brain and sensorium becoming completely engaged with the picture, the spine continued the action, in the manner indicated in the text.

The intimate structural union of the sensorium with the brain precludes the possibility of any physical obstacle to their free inter-communication; but the principle just laid down may be extended to these two organs, by careful observation of certain mental conditions. The most important of these are Reverie and Somnambulism, in each of which the brain is torpid to impressions from below; an effect produced, in the one case, by pre-occupation; and by partial sleep in the other. The rationale of these conditions will be more properly considered, in connection with the special offices of the brain; and it is sufficient to say at present that they do for the sensorium, what an accident will sometimes do for the cord; they compel it to react alone upon impressions, by placing a temporary barrier to their transmission.

In the human subject, one of the most important uses of the sensorium—or, in other words, of the senses—is to guide our voluntary movements, by exciting just ideas of the size, form, and position, of surrounding objects. In conformity with these ideas, we direct our steps in walking; so as to continue in the path we wish to pursue, and to avoid any obstacles which it may contain. For these purposes, we generally trust to impressions made upon the sense of vision; and when we are interested in surrounding objects, when the brain and the sensorium are working together, the sensation and the idea are produced simultaneously; and it would be difficult to determine the share of each in producing the actions that follow them. But, as the idea is a prominent subject of consciousness, unreflecting persons are apt to

conclude at once, that they are dependent upon it for guidance; and that they avoid a post on seeing it, because the sensation calls forth an idea of its nature and qualities, and informs them that they would suffer, from violent contact with the object possessing them. This view of the case, however, is perfectly erroneous; for it is found that, when the brain, from pre-occupation with a train of thought, is for a time totally insusceptible to new impressions, the visual sensations guide the steps with perfect safety and unerring accuracy; not passing on to excite ideas, but reacting at once through the sensorium, and producing the necessary movements. Dr. Carpenter relates an anecdote of a mathematician, who resided three miles from Birmingham; and who, in a state of profound abstraction, having the solution of a problem for its object, walked into the market-place of that town without his hat, and without being aware, until recalled to his ordinary state of existence by a greeting from an astonished friend, that he had strayed beyond the limits of his own garden. He had, of course, no *knowledge* of the various objects which he must have met in his walk; for no *ideas* had been excited by them; but it is manifest that his *sensations* had enabled him to avoid them all, because any shock would have broken his trance, as effectually as the hand and voice of his friend broke it at last. From this, and from many similar instances, we are obliged to conclude that the sensorium supplies the essential part of the mechanism by which we are guided, in reference to external objects; and that, when the impression goes on to excite an idea, and a determination in con-

sequence of it, the will does but perform the action, voluntarily, that would have been performed instinctively without its interference. The fact thus established is of great importance, and requires to be carefully borne in mind when estimating the true character of many of the actions of the lower animals. It shows that an evident adaptation of means to an end does not necessarily involve the existence of an intelligent will, on the part of the creature using them; more especially if the end be something essential to its well-being, or forming part of its habitual operations. In such case, there is usually a contrivance for its attainment, in the involuntary or instinctive action of the cord or of the sensorium; and the *motive* must be sought for, not in the faculties of the animal itself, but in the mind of the beneficent Creator, by whom its organism has been contrived.

In the state of health, a few purely sensorial actions are constantly performed, although they are not of a character to attract much notice. Among them may be mentioned the movements of the iris (or coloured portion of the eye) which regulate the size of the pupil, and the quantity of light admitted to the optic nerve. The iris is an opaque muscular curtain, placed behind the transparent front of the eye; firmly fixed by its outer border, and having an opening in its centre, called the pupil, through which light penetrates to the internal parts of the organ, and through which their black colour is seen from without. The iris possesses great contractility, and, as its outer edge is immoveable, the size of the pupil is diminished by its contraction, and increased by its expansion; and

these opposite conditions are entirely dependent upon sensorial action. On exposure to a bright light, the sensation produced by it reacts immediately, directing motor force upon the iris, and partially closing the opening; while in a dim light, or in comparative darkness, expansion or relaxation follows the withdrawal of the stimulus.

It has been already said, that the sensorium must be regarded only as a portion of the spinal cord, in which the changes are *accompanied* by sensation; at the same time that they develop motive force. This is well illustrated by a kind of blindness, known as amaurosis, or gutta serena, in which the part of the sensorium concerned in vision is reduced to the condition of the cord; its changes continuing to produce motion, but no sensation attending upon them. When this condition exists, the sufferer is totally unconscious of the difference between light and darkness; but the iris still contracts under the influence of the former, and relaxes when it is withdrawn,¹ clearly showing

¹ The above observation does not apply to all cases of amaurosis, but only to those rare ones, in which the sensorium itself is the seat of the disease. The word is commonly used to signify every variety of blindness which depends upon disorder of the nerves, the eye continuing healthy; and the equivalent term, gutta serena, or *clear drop*, expresses only the negative of gutta opaca, *opaque drop*, or cataract, in which there is visible opacity of the naturally transparent parts of the eye. Thus, amaurosis may depend upon disease of the optic nerve, preventing the passage of impressions from the eye to the sensorium, and then, of course, the contraction described in the text will not take place. Amaurosis was the cause of Milton's blindness. He writes, with reference to his own eyes,

“So thick a *drop serene* hath quench'd their orbs.”

that sensation is not a necessary result of the vital activity of those portions of the nervous centres which minister to it; or a cause of the movements which originate in them: but that it is merely a faculty added on, in order to conduce to the pleasure of the animal.¹

¹ An highly interesting illustration of the pleasure which sensation may afford has been furnished by Mr. Dugald Stewart, in his account of James Mitchell, a boy who was born partially blind, and totally deaf. Mr. Stewart says:

“At the time of life when this boy began to walk, he seemed to be attracted by bright and dazzling colours; and though everything connected with his history appears to prove that he derived little *information* from that organ, yet he received from it much *sensual gratification*.

“He used to hold between his eye and luminous objects, such bodies as he had found to increase, by their interposition, the quantity of light; and it was one of his chief amusements to concentrate the sun’s rays by means of pieces of glass, transparent pebbles, or similar substances, which he held between his eye and the light, and turned about in various directions. These, too, he would often break with his teeth, and give them that form which seemed to please him most. There were other modes by which he was in the habit of gratifying this fondness for light. He would retire to any outhouse, or to any room within his reach, shut the windows and doors, and remain there for some considerable time, with his eyes fixed on some small hole or chink which admitted the sun’s rays, eagerly catching them. He would also, during the winter nights, often retire to a dark corner of the room, and kindle a light for his amusement. On these occasions, as well as in the gratification of his other senses, his countenance and gestures displayed a most interesting avidity and curiosity.

“It was difficult, if not impossible, to ascertain with precision the degree of sight which he enjoyed; but from the preternatural acuteness which his senses of touch and smell had acquired, in con-

Next after the changes in the pupil, the sensorial movements most frequently witnessed are those concerned in the acts of sneezing and yawning. These are both complicated operations, requiring the united action of many muscles; and not to be performed at will, or without the operation of their usual causes. Sneezing is excited by an irritation of the lining membrane of the nose; which, when it becomes sufficiently intense to be felt, acts at once through the sensorium, often without reaching the brain, and produces an effort, having for its very evident purpose the removal of the source of irritation, whether this be natural or artificial. The swelling of the passages of the nose at the commencement of a cold is the most frequent example of the former kind; and the well-known effects of pepper, snuff, and various other powders, will abundantly illustrate the latter. There are some persons whose noses are exceedingly susceptible to the presence of substances, which, in others, produce little or no irritation; and the dust of ipecacuanha, and of hay, especially of new hay, may be mentioned as acting very energetically upon such individuals, often producing violent paroxysms of sneezing. The late king William the Fourth was always driven to the seaside during the time of hay-

sequence of their being habitually employed to collect that information for which the sight is peculiarly adapted, it may be presumed with confidence, that he derived little, if any, assistance from his eyes, as organs of vision. The appearances of disease, besides, in the eyes, were such as to render it in the highest degree probable that they enabled him merely to distinguish colours, and differences in the intensity of light.

making; and it is said of a well-known London druggist, that his assistants can send him out of his shop at their pleasure, by opening a bottle of ipecacuanha. The instinctive character of a sneeze is abundantly proved by the extreme difficulty of preventing it; a difficulty that has been experienced by the great majority of mankind at some time, or times, when silence was particularly desirable; and its preservative operation, in forcibly expelling insects or other noxious things from the open and accessible passages of the nose, will be readily apparent to every reader.

The purpose of the act of yawning is not so obvious, except that it is attended by a full and deep inspiration; and it is dependent upon a wider range of causes for its production, often arising spontaneously in those who are fatigued or drowsy, and being readily excited by sensations or ideas, especially when they are aided by the predisposing influence of lassitude. Confining ourselves at present to its sensorial excitation, it may be observed that the sight of a yawn (that is, its occurrence within the range of vision, whether it become the subject of an idea or not) is usually, or almost invariably, followed by the performance of one; this response being often made unconsciously, especially if the person making it have his brain pre-occupied, by attention to something that engages him for the time. Again, any regular and slow movement of the hand will often produce yawning in those who witness it, at least if they are somewhat tired, and if they do not know themselves to be the subjects of experiment. This may be readily proved in any small party, where

there is a dearth of amusement and of conversation ; but if the object were perceived, then, of course, an effectual spirit of resistance would be aroused. Another illustration of sensorial action is furnished by the involuntary closure of the eyelids when an object is seen to approach them. The power to prevent this, by an effort of volition, varies considerably in different individuals ; but a sensation constantly excites a movement, when, if an idea had first been formed, the movement would have been arrested as uncalled for. The closure of the eyelids, taken in conjunction with the sneeze, shows that it is an important office of the sensorium to protect, by its independent action, the organs through which it receives information ; and either to keep out, or to drive out, everything that is calculated to offend or injure them.¹

We have thus seen that the sensorium of man possesses full power of developing motive force, when circumstances call it into activity ; and also that this power is habitually exercised with regard to those organs which are immediately subordinate to it. But, in its operation upon the body generally, it holds a kind of viceregal position under the intelligence, acting by itself only when the brain is pre-occupied, or when, in some sudden and great emergency, such extreme

¹ The ear, a very important inlet to the sensorium, is not guarded by any movements analogous to those above described ; but this deficiency is supplied, by the viscosity and bitterness of the wax which it secretes, and which effectually prevents the intrusion of insects. In quadrupeds, moreover, there is the additional protection of the large, and often pendulous flap, with its barricade of strong internal hairs.

promptitude is required, that there is, so to speak, no time to be lost in consulting it. Instances of the latter kind point to the sensorium as the seat of the *instinct of self-preservation*, and are supplied by the simple movements of defence, as in raising the hand to stop a descending blow.¹ When performed under unusual circumstances, or in great danger, these movements are commonly cited as illustrations of "presence of mind;" but, except in a few cases, this phrase would convey a very erroneous notion of their real character. They are, generally speaking, produced by the instantaneous reaction of sensory impressions: the brain having nothing whatever to do with them; and absence, rather than presence, of mind, being the essential condition of their performance. It has often happened that individuals have become sick and faint on looking back at a dangerous situation from which they had just before delivered themselves: this result following immediately upon the formation of a distinct idea of the peril; and clearly showing that, if their minds had been "present," their power of exertion would have been paralysed rather than increased.

¹ The sensorium, when released from the guidance of the brain, will often take very unnecessary precautions for the safety of its possessor. The author was once going down the Thames in a steamer, completely engrossed by a train of thought; and in passing under one of the bridges felt himself suddenly impelled to take a considerable leap, to the no small amusement of his fellow-passengers. He had chanced (but quite unconsciously) to turn his eyes upwards, just in time to see the funnel lowered, in order that it might clear the archway of the bridge; and the instinctive reaction of this sensation, at once, and without the formation of any idea, placed him beyond the reach of the apparent danger.

But when there is "time to think," or when the brain is at liberty to receive new impressions from below, the functions of the sensorium are limited, with regard to the body generally, to the supply of the information necessary to the carrying out a proper course of action. The brain has no power to depute its motor office to the inferior organ; but is compelled to accept the whole responsibility, when once an impression has reached it, and has excited an idea. Hence it is, that timid or weak people are always found to act better in an emergency entirely sudden, than when they have a clear appreciation of danger beforehand, and a little time in which to prepare for it. Under such circumstances, the sensorium can give them no help; and the mind, distracted by apprehension, and unable correctly to estimate the relative importance of the various ideas which crowd upon its consciousness, only adds confusion and perplexity to their dismay. They have an opportunity for the display of real presence of mind; but, unless the mind be equal to the occasion, there will be no power to take advantage of it.

The last office of the sensorium is to feel the changes which take place in the brain itself,—that is, the ideas and volitions,—for it is presumed, on evidence that will presently be stated, that the various intellectual states are not attended by any consciousness of themselves; and that, in order to become acquainted with them, it is necessary to observe them through the agency of sensation, just as it is necessary to observe the appearances of an object of vision. In this respect, sensation holds the same office with reference to the brain that it

does with reference to the cord; making us acquainted with changes that would produce their proper effects, whether we were aware of them or not. But in order to put this in the clearest point of view, the operations of the brain must first be examined and understood; and they will, accordingly, furnish the subject-matter of the next few pages.

In the brief account of the brain given at page 9, it is said that it supplies the instrument of the will, and of all the intellectual operations; but this arrangement must be reversed in a more detailed description; the intellectual operations being first discussed, and the power of the will in guiding and controlling them being reserved for subsequent consideration.

It has been already stated, that the chief purpose of sensation is to add pleasure, and, by necessary consequence, sometimes pain also, to changes that are in themselves essential to the safety of the animal in which they take place; and it may farther be said of the formation of ideas, that their object is to add knowledge to the pleasure or pain. There is reason to believe that the brainless insect, and the very young offspring of the higher animals, are perfectly unconscious of the *causes* of their various feelings; recognizing them only as states of comfort or uneasiness, and without any reference to external influences. Cases have also been recorded in which deficiency of certain senses has dated from the period of birth; and in these there has been evidence of the existence of imperfect sensation, not as a source of knowledge, but only as a source of pleasure or pain.¹ And even in the fully-

¹ See note to page 33.

formed adult, there are many feelings which do not admit of being traced, by the consciousness, to their origin. Such is the gloom or depression with which most persons are occasionally visited; and to which those of a bilious temperament are particularly liable. This is caused, generally speaking, by *feeling* in the blood the presence of bile, or other hurtful matters; but it is seldom that the sufferer can assign a cause for it, unless taught to do so by previous experience of the curative effect of a dose of calomel. Persons of weak and superstitious minds, ready to be satisfied by any explanation that removes a difficulty one step farther from them, commonly attribute this depression to a presentiment of coming evil; and as, once in a hundred times, some evil does actually happen before the presentiment is forgotten, the belief in this kind of foresight has been very generally spread. But if due regard be paid to the numerous instances in which such a coincidence does not occur, it will be sufficiently evident that sensation is really independent of knowledge; and that an organ possessing powers in which the sensorium is deficient, is required, in order to point out to us the nature, and the source, of our various feelings.

This want is supplied by the brain, to which, whenever they can do so, the sensations pass on, determining a certain change in its grey matter; and this, communicating itself to the sensorium, becomes a subject of mental consciousness, no longer in the shape of feeling, but as knowledge; and is then denominated an *idea*. A simple idea may, when it is first formed, be defined as a perception, either

of the nature, or of the immediate cause, of a sensation.

The history of the formation of ideas furnishes a curious instance of the number and complexity of the results that may be obtained by the different combinations of the same few elements; but the limited space of the present volume will only admit of indicating the line of inquiry by which this history may be traced out. It is usual to assign the idea of individuality, that is, of distinctness from the surrounding objects, as the commencement of intellectual life in the infant; because this idea follows, necessarily, from the first recognition of those objects as the causes or excitors of sensation. After this, the sensations conveyed through different organs furnish simple ideas, which are combined by virtue of the principle of association, one of the most important of those regulating the operations of the brain; and which may be stated in the following manner:—When two ideas have been constantly or frequently excited in immediate succession, the formation of one of them will recall the other to the mind; and if the second have a third associated with it, the third will be recalled also, and so on *ad infinitum*. By this process, an infant, having first formed ideas of some of the properties of surrounding things, as recognizable objects of sensation, will associate together any two properties which he is accustomed to perceive combined in the same thing; but which appeal to his sensorium through different inlets. In this way he might combine ideas of form and colour, and, if accustomed to play with a red ball, it is probable that he would associate the red colour with the

shape of that particular plaything, and would spontaneously think of, or remember, red, when a ball of a different tint was presented to him. Again, if his nurse were accustomed to wear a red ribbon, an idea of this would be likely to follow; then an idea of the nurse herself; and next, of the food he was in the habit of receiving from her. In such a manner as this, the mind of the young child becomes furnished with many ideas; some of which are of an universal character, and follow of necessity from its earliest sensations, when once the knowledge of individuality has been gained. These universal ideas have been supposed to be innate, that is, to be present in the mind of the child at birth, and before sensations have had time to operate upon it; but it is more reasonable to believe that the brain is so constructed as to form them in response to the sensations communicated by the simple and universal properties of matter. These must necessarily be presented to the child before it is possible for him to give any expression to his thoughts, and it is highly probable that the process which we afterwards witness adding to the structure of knowledge, is the same that has been employed in laying its foundation. Why a change in the brain should be an idea, we know not; and must regard the fact as inexplicable, or as lying beyond that limit which our imperfect faculties place around our desire for information; but, as we have daily evidence that the fact is so, there is no difficulty in supposing that the first idea has the same source as those subsequent to it. And as, after all, the question is one of words only, no possible advantage can be gained by pursuing it farther; so that,

passing over the very earliest intellectual actions, we will proceed to the consideration of those, which, requiring at first the information of two sensations, are at last excited by either of them ; association supplying the knowledge given, in the first instance, by the other.

Of these, the idea of Form is the first and simplest, and is usually excited by the combined action of the senses of touch and sight, although the first of them would alone be sufficient for its production. After a while, the child becomes so familiarised with the appearance of things, that, on seeing them, he remembers how they feel ; and thus the complete idea is built up and perfected in his mind ; the outline being supplied by vision, and the solidity by association. Form, therefore, is necessarily suggested to the mind of the child who can see and handle ; and if he could only handle, his memory would speedily enable him to recall, by the first touch, the results of former more minute examinations. But it is evident that this first touch would be necessary, in order to his doing so ; or that he must at least touch some similar object, or experience in some way a sensation to which he was accustomed in connection with the familiar thing. For if the idea of it were once absent from his mind, there must be something to recall it before it could enter again ; and this something is supplied by association. In the case we are considering, the two senses of touch and sight are early and frequently brought into consentaneous action ; and the sensations derived from each are so soon linked together by frequent practice, that the process above described might escape the notice of a superficial observer. But a

slight modification of it may more easily be seen in watching the gradual formation of correct ideas of distance. If an attractive toy be offered to an infant, he will almost invariably fail in his first attempts to take hold of it, his unaided sight having given him no knowledge with regard to its exact position. But after one or two trials, he will succeed in his endeavour; and then will gradually learn how far he must reach, in order to touch a thing, which produces a certain effect upon his eye. He will learn, also, from the changes in its appearance, whether it be moved nearer to or farther from him, not having, as at first, to feel for information on this point. Thus, after a time, he will rely entirely upon his sight for the determination of distance, and will extend the range within which this determination can be accomplished; but yet will extend it only by practice; for the association must be formed before it can be made available, and an adult whose vision has been constantly limited by the buildings of a town, will be unable to ascertain, by sight, the extent of a rural landscape. Never having tested the actual distance of far-off objects, by other senses, his just estimate of one hundred yards would not bring him one whit nearer to a correct guess between ten miles and twenty. If, however, he were well acquainted with the appearance of scenery which extended fifteen miles from his point of sight, an idea of that scenery would instantly be recalled, by its association with the newly excited idea of distance, and it would be applied as a gauge or measure to the landscape before him.

The association together of two sensations to com-

plete the ideas of form and distance is an occurrence that must take place with all children pretty much in the same way, and with much the same results ; because the qualities which excite the sensations are constant and invariable, and produce the same effect upon all healthy individuals. It is inconceivable that any object should convey the idea which we call round to one person, and the idea which we call square to another, by whatever channel it was introduced to either ; and hence, the ideas of round and square are always distinct, perfect, and attached to the same tactile and visual sensations.

But there are simple ideas attaching themselves to different kinds of sensation, and associated together by all persons, one of which has only an accidental link, not a natural one, serving to bind it to the other. The best example of this connection is furnished by language.

Assuming, in the first instance, that it is necessary to the happiness of man to possess the power of calling into the mind of his fellow the same ideas that occupy his own, let us consider the various methods by which this object may be obtained. It has been already said, that an absent idea can only be made to return, either by a sensation which re-excites it, or which excites another associated by experience with the desired one, and therefore capable of producing it in turn. Suppose then a meeting between two persons, A and B, and that A wished to interest B in a third person, C, who was not present at the time, either personally, or in B's thoughts. The only way (setting aside speech) in which A could accomplish his purpose would

be to present to B some object that would excite a sensation, the idea of which was associated with the complete idea of C himself. This might be done by a portrait, when the sight of that which resembled a part of C, and the idea of what it was, would instantly be followed by the idea of the man. But this method of communicating ideas would require the constant presence of a great number of pictorial and other representations, after the device of the Laputan philosopher; and as, notwithstanding his belief in the superiority of his plan to language, the human race has hitherto been of a different opinion, it is customary to excite ideas in others by the aid of a less cumbrous machinery. For this purpose, great care is taken in childhood to procure the formation of associations between objects and certain sounds which are called their names; until, the name being constantly repeated in connection with the thing, the idea of the name recalls the ideas of all the other sensations which that thing is fitted to excite. And it must be remembered, that the name, as a sensation of sound, acts upon the brain in precisely the same way, and is as much an *object* with regard to it as the picture was in occasioning a sensation of sight; the only difference being, that the association between the man and the picture is essential, and a necessary consequence of their possessing certain qualities in common; while that between the man and the sound is accidental, and contingent upon the knowledge of a particular language,—that is, of the circumstance that others have formed such an association in their own minds, and for their own convenience.

Having thus seen two methods in which ideas may be connected,—namely, by the necessary co-existence, in every object, of qualities that appeal to different senses, so that the sensory impression caused by one quality shall recall the others to the memory; and by the accidental circumstances which may extend the appeal of any object to another sense, over and above those which it was naturally calculated to impress,—the nature and order of their succession must be the next subjects of consideration. With regard to the first of these, it may be repeated, that, when an idea has been excited by the transmission to the brain of a spinal or sensorial impression, the resulting or ideational state is one of activity, attended by the liberation of force. This force may be manifested in two distinct methods, by acting downwards, through the sensorium and spine, upon the muscular and other organs of the body; or by concentrating itself upon the brain, so as to work there, in quick succession, a series of changes, commonly known as a *train* of ideas. This series may be either carried on until the force developed in response to the original impression is exhausted; or it may be interrupted midway, and the remainder of the force may be turned upon the body; an effect which will follow instinctively from the necessity for action; or which, apart from this, may be produced by the exercise of volition.

The continuance of the ideational state having been provided for by the laws of cerebral activity, the character of the ideas which chase each other through the brain is determined chiefly by the existence of that connecting link between them which has received the

name of association; and which has already been referred to above. The circumstances by which ideas are thus related to each other are various; and, although an attempt has been made by Hume to classify them, and to reduce them all to the three heads of resemblance, contiguity of time and place, and cause and effect, yet it has been well stated by Mr. Dugald Stewart, that "there is no possible relation among the objects of our knowledge which may not serve to connect them together in the mind, and, therefore, although one enumeration may be more comprehensive than another, a perfectly complete enumeration is scarcely to be expected."¹ The same

¹ 'Elements of the Philosophy of the Human Mind,' part i, chap. 5. The whole of this chapter is replete with instructive suggestions on the subject of association; and the following passages have been transcribed from it, as bearing particularly upon questions that will hereafter demand our notice.

"It is not merely in consequence of the relations among things, that our notions of them are associated: they are frequently coupled together by means of relations among the words which denote them; such as similarity of sound, or other circumstances still more trifling. The alliteration which is so common in poetry, and in proverbial sayings, seems to arise, partly at least, from associations of ideas founded on the accidental circumstance of the two words which express them beginning with the same letter. . . . This, indeed, pleases only upon slight occasions, when it may be supposed that the mind is in some degree playful, and under the influence of those principles of association which commonly take place when we are careless and disengaged. . . . The view of the subject which I propose to take, does not require the complete enumeration of our principles of association. There is, however, an important distinction among them, to which I shall have occasion frequently to refer, and which, as far as I know, has not

writer quotes from Hobbes, an instance of the great and sudden transitions which association will some-

hitherto attracted the notice of philosophers. The relations upon which some of them are founded are perfectly obvious to the mind; those which are the foundation of others, are discovered only in consequence of particular efforts of attention. Of the former kind, are the relations of resemblance and analogy, of contrariety, of vicinity in time and place, and those which arise from accidental coincidences in the sound of different words. These, in general, connect our thoughts together, when they are suffered to take their natural course, and when we are conscious of little or no active exertion. Of the latter kind are the relations of cause and effect, of means and end, of premises and conclusion; and those others which regulate the train of thought in the mind of the philosopher, when he is engaged in a particular investigation.

“It is owing to this distinction that transitions, which would be highly offensive in philosophical writing, are the most pleasing of any in poetry. In the former species of composition we expect to see an author lay down a distinct plan or method, and observe it rigorously, without allowing himself to ramble into digressions, suggested by the accidental ideas and expressions which may occur to him in his progress. In that state of mind in which poetry is read, such digressions are not only agreeable, but necessary to the effect; and an arrangement founded on the spontaneous and seemingly casual order of our thoughts, pleases more than one suggested by an accurate analysis of the subject. . . .

“The facility with which ideas are associated in the mind, is very different in different individuals; a circumstance which, as I shall afterwards show, lays the foundation of remarkable varieties among men, both in respect of genius and of character. I am inclined, too, to think that, in the other sex (probably in consequence of early education), ideas are more easily associated together than in the minds of men. Hence the liveliness of their fancy, and the superiority they possess in epistolary writing, and in those kinds of poetry in which the principal recommendations are, ease of thought and expression. Hence, too, the facility with which they contract

times effect. "In a company," says he, "in which the conversation turned on the civil war, what could be conceived more impertinent than for a person to ask abruptly, What was the value of a Roman denarius? On a little reflection, however, I was easily able to trace the train of thought which suggested the question: for the original subject of discourse naturally introduced the history of the king, and of the treachery of those who surrendered his person to his enemies; this again introduced the treachery of Judas Iscariot, and the sum of money which he received for his reward. And all this train of ideas," says Hobbes, "passed through the mind of the speaker in a twinkling, in consequence of the velocity of thought." It is by no means improbable, that if the speaker himself had been interrogated about the connection of ideas which led him aside from the original topic of discourse, he would have found himself, at first, at a loss for an answer.

But, notwithstanding the infinite number of relations which exist between one idea and others, the chord actually struck by each will depend, in the main, upon the habit of the particular mind in which it is called forth. An accidental or non-essential relation may become, by its frequent occurrence in the experience of an individual, the one which shall be suggested to his brain, to the setting aside of others in themselves obvious and necessary. For

or lose habits, and accommodate their minds to new situations; and, I may add, the disposition they have to that species of superstition which is founded upon accidental combinations of circumstances.

instance, a narrative of something done would appear most likely to suggest, to an unbiassed mind, ideas of the consequences likely to result from the action. But if told to an artist, he would, perhaps, think chiefly of the lineaments and gestures of the person who was principally concerned. And, in like manner, the consequences that would first suggest themselves to each individual would be events of the class with which he was most familiar. The physician would think of health, the lawyer of property, as these might or would be affected. If an act of bravery were narrated, the timid man would think first of the danger of the achievement; and the hero of its glory. By the general operation of this rule are produced those class views, sympathies, and prejudices, with which all who look upon the world are familiar. But in spite of these, it is impossible to predict the sequence of ideas with any approach to certainty; because the relations of every one being infinitely numerous, there may be some accidental, but powerful, association with each, tending to divert the current of thought from its proper channel; and to turn it into one utterly new and diverse. Every one has read the description of the gentleman who received the most startling announcements with composure, saying, that they reminded him of an opinion he had either expressed to, or heard from, some insignificant person among his acquaintances; whose name, when thus mentioned, served as an introduction to anecdotes about him, or to other matters connected with his history; while the starting point of the conversation, however remarkable it might be, was consigned to immediate and

complete oblivion.¹ Putting aside exceptional cases, such as this, in which there is an excessive aptitude for seizing upon the trivial and irrelevant; and putting aside, also, the instances in which a calling or profession furnishes the prevailing associations, so as often to supply, from its technicalities, a cant phraseology for the daily and common affairs of life: it will be found that locality, or contiguity of place, is the source of the closest and most universal relations between the ideas of the generality of mankind. If a person be asked whether he have seen another? he will frequently reply, that he met him at such and such a *place*. If an endeavour be made to recall past events to the mind of a forgetful man, nothing is more usual than to appeal to him through the idea of the place where they occurred; and it is in the experience of every one, that a return to places after long absence from them, will always be followed by the recollection of a tide of past events and feelings, which no other occurrence has the same power to bring back before the consciousness. A giddy child, who comes hastily into a room in quest of something; but whose idea of the object of desire has been succeeded by twenty others on the way, is frequently unable to remember what was wanted, until, by returning to the place from whence he came, the original wish is recalled. Among the lower animals, the horse is strikingly conspicuous for the tenacity and force of this association; stopping of his own accord at his master's accustomed halting-place; distinguishing his

¹ 'Essays,' by Robert Chambers.

especial stall in the largest stable; and even accurately retracing, after the lapse of years, the road on which he once has travelled. This predominance of place, over other associations, has impressed itself in a curious manner upon language. It was the practice of the ancient Grecian orators to assist the memory of their audience by selecting the most conspicuous objects or places within view; and by attaching to each of them one division of their argument. Looking themselves towards the object, they desired all who heard them to do the same; and to associate an idea of it with the part of the oration to which it was attached. Hence, the Greek word for place came to be applied to matters that were spoken of; and hence, in the present day, we still refer to the *topics* of a discourse.

The spontaneous succession of associated ideas is called, in common parlance, the *remembrance* of them; because the idea, after being for a time absent from the consciousness, is again presented to it. And, in accordance with the facts just mentioned, it is found that the direction of spontaneous memory is chiefly guided by the accidental relations formed by each individual for himself. The essential relations appeal with nearly equal force to all men of average intellect; but the accidental relation which each one has observed, clings with peculiar tenacity to his mind. Thus, a lover of history may laboriously acquaint himself with the dates of the minutest events of his study; until, no sooner is one of these events mentioned to him, than the time at which it happened is remembered in close succession. He is said to have a

good memory for dates ; and, in like manner, men may cultivate any kind of arbitrary association, until neither time nor circumstance can break the bond which it has formed.

The most curious fact connected with remembrance is, that no idea ever passes from the mind entirely, so as to be irretrievably lost. Whenever an impression has gone beyond the sensorium, the consequent idea becomes part of the individuality or identity of its possessor ; and whatever time may have elapsed since it was present to his mind ; or however complete may be his apparent forgetfulness of the event to which it referred, there will always be some train of thought which, when excited by design or chance, will lead back to its recovery. A case is recorded by most writers on the subject of memory, of an illiterate old woman who, in the delirium of fever, recited sentences and passages in the Hebrew language, of which, on her recovery, she had not the slightest knowledge. By tracing her former history, it was found that, in early life, she had been servant to a gentleman who was in the habit of reading Hebrew aloud during her attendance upon him ; and that the sounds which she had then heard (without understanding them) had been recalled to her, after an interval of many years, by some occurrence of her illness. In the autobiography of Sir John Barrow, there is a narrative by Admiral Beaufort of his own mental condition during partial drowning. He was not taken from the water until life was nearly extinct, and he says that, after the cessation of ordinary consciousness, every action of his past existence was distinctly presented to his

memory,—no individual one having any prominence over others ; but all, even the most trivial incidents of childhood, being remembered in the order of their occurrence. It was as if a mental panorama had been unrolled before him, and many of the events were such as, under the ordinary circumstances of life, would probably never have been recalled. Other cases of a similar kind are recorded by various writers ; but this one, from the circumstantiality of its detail, and from the character of the relator, is the most satisfactory with which I am acquainted. Indeed, Admiral Beaufort's narrative is well worthy of an attentive perusal.

The rapidity of a train of thought is another circumstance deserving of notice ; as it is one that admirably illustrates the extreme velocity of the operations of the nervous system.¹ In the case above quoted, the whole process, involving the distinct and successive contemplation of ideas almost infinite in number,

¹ There is much reason to believe that the rapidity of the transmission of electricity along the wires of the telegraph may be taken as a fair index of the speed of nervous action. The telegraph is now in operation on the continent of America, in an unbroken line of 1000 miles in length ; and the passage of a despatch for this distance does not occupy a period sufficiently long to be measured by any instrument ; the departure and the arrival being apparently simultaneous. Professor Wheatstone invented an apparatus capable of marking the two millionth part of a second ; but on applying this to twenty miles of telegraphic wire, the transmission of electricity along it was found to be accomplished within that almost inappreciable space of time. The kindred agent, Light, is believed to travel at the rate of about 200,000 miles in a second of time.

must have been commenced and completed during the scarcely appreciable interval between partial and absolute stupefaction ; while the phenomena of dreaming, together with some others, demonstrate that this rapidity is by no means exceptional. Indeed, the greater number of dreams are limited to the half-awake condition ; and occupy, therefore, an exceedingly short space of time. Almost every one has been occasionally roused from sleep by a knocking at the chamber-door, and many have experienced that the first effect of this knocking may be to excite a dream, the course of which is changed by each successive tap ; and whose events or ideas may be so numerous, that the sleeper will imagine them to occupy a considerable period, as of months, or even years, although, in reality, before half-a-dozen knocks are given, he will be sufficiently awakened to respond to the call. Hence it is evident that the notion of time is one that the mind derives entirely from the information of the senses ; and never from the amount or variety of its own labours. Time has indeed been described as “the measure of the motions of the heavenly bodies ;” and if the extent of their motion be concealed from a thinker, he will be apt to conclude that sufficient time has passed by for the performance of the actions whose ideas have been present to his consciousness. This delusion has often afforded material to writers of fiction, who have availed themselves not only of the instances in which the rapid and successive remembrance of events requiring time for their occurrence, has greatly extended the apparent length of a short period of meditation ; but of those, also, in which the

continued contemplation of a single idea has produced total inattention to the passing hours.¹

The effect of a train of ideas upon the sensorium varies under different circumstances. Frequently, or perhaps most frequently, each one of the series communicates an impression to that organ, and causes its transient presence to be felt, so that the whole course of thought is known as it proceeds. This is the case in ordinary reverie, when the individual is conscious of each successive idea; and, still more remarkably, in the forms of reverie which are attended by those golden visions called castles in the air. But it often happens that the sensorium is impressed only by the prominent ideas of a series, or by those which have, in some degree, the character of results; the others, the intermediate links between these results, and by the aid of which they were attained, never becoming subjects of consciousness at all. This is instanced by the manner in which a fact we have been vainly trying to remember will occasionally flash upon the mind when the wish for it is past; and when there has been no association with any external thing to recall it suddenly to remembrance. Such an event is one of constant

¹ The former of these positions is illustrated by the well-known story in the *Spectator*, in which a dervise desires a monarch to plunge his head into a vessel of water; and causes him, during the momentary period of immersion, to undergo, in imagination, many years of poverty and hardship; so that, on raising his dripping head from its bath, he can scarcely believe himself to be still surrounded by faithful guards, and by obsequious courtiers. The latter is the foundation of "The Monk and the Bird," a poetical allegory of singular power and beauty, written by the Rev. R. Chenevix Trench.

occurrence ; and is easily explicable on the supposition that a train of thought, having been set in motion in the right direction, continues, without affecting the sensorium, until the desired idea is arrived at ; and then, for the first time, excites a downward action. Under such circumstances, it would be quite impossible to trace out the various associations which led, by successive steps, to the result ; because, never having made themselves known, they could not be recognized, even if exactly repeated at a time when the sensorium was attentive to them. Many combinations of ideas are constantly formed in the mind by the aid of practice, there being no distinct consciousness of each of them ; but only of the effect produced by their union and succession. Thus, in reading, it is evident that the idea of a sentence must be built up of the ideas of the separate words composing it, and these again of the ideas of the letters composing them ; but it will be seldom found that a reader is aware of any such mental process. The sensorium is usually too much occupied with the prominent idea of the author's meaning, to take heed of the exact characters or sounds through which this meaning is conveyed. But in reading to correct the press, a precisely opposite mental act is required ; and the difficulty of achieving it is greater than at first would be imagined. The association formed by constant habit, not with the words and letters, but with the sense, is so strong, that the mind can scarcely be restrained from wandering back into its accustomed paths. Hence it is, that a book entirely free from typographical errors has scarcely ever been published ; for, notwithstanding

the greatest care, they will, now and then, escape observation. The proof sheets of Foulis's Homer were, after most attentive private revision, hung up in a public place in Edinburgh, and a reward was offered for every misprint that could be found in them ; but, notwithstanding this singular precaution, one or two were not detected until after the issue of the work. The mental processes of arithmetic are precisely analogous to those of reading. For instance, a child learning addition is compelled to make the idea of the value of each figure a subject of laborious attention. But when he becomes an expert calculator, the column will be rapidly cast up, not one of the units composing it resting upon his mind for an instant. And some persons have possessed, from early childhood, the power of immediately resolving the most intricate arithmetical questions, (not merely applying rules, by the aid of a good memory, so as to dispense with the usual memoranda of the successive steps of the process, but) the original idea exciting a train of thought in their minds, by which the desired result was evolved with inconceivable swiftness ; while they themselves had no knowledge whatever of the series of intermediate ideas ; and, consequently, were utterly unable to reduce them to writing.¹ In ordi-

¹ Mr. George Bidder, now an eminent engineer, and once known as the "calculating boy," affords the best example of the faculty mentioned in the text, which has, however, been by no means confined to him. At a very early age, Mr. Bidder was able to give, in a few moments, the solution of any arithmetical problem that could be proposed ; and I have been informed that the accountants of a railway in which he is concerned are still in the

nary musing, or purposeless thinking, a state which differs from reverie chiefly in degree, it may be observed that, every now and then, some idea will impress the sensorium more forcibly than those that precede or follow it, being said to *strike* upon the mind; and sometimes, perhaps, being sufficiently powerful to originate a course of conduct. Failing to do so, it will be succeeded, probably, by others of a less marked description; until, after an uncertain interval, a more forcible idea be again experienced, which will either develop greater activity than its precursor, or else will follow it into temporary oblivion.

The circumstance of an idea passing downwards, and so acting upon the sensorium as to be felt, without its working any bodily change, shows that, even during the excitation of a train of thought, the accompanying force is not limited to the brain exclusively, although it does not reach the spinal cord. But it will have been gathered from former observations, that the force of an idea is frequently altogether diverted from the brain; and that, in such case, it passes through the sensorium, and ultimately makes itself felt through the medium of the cord.

By this kind of operation, a great number of highly-interesting and important movements are frequently performed; which have only recently been described as fairly belonging to the domain of instinctive or

habit of submitting to him the results of their most intricate and elaborate calculations, in order that he may, in an instant, and with unerring accuracy, pronounce them to be correct or erroneous. A person so gifted would not be likely to acquire the art of pen and ink calculation, and it is said that Mr. Bidder has never done so.

automatic action. It is, indeed, but a very short time since the intellectual operations were considered to be necessarily volitional; but Dr. Laycock having shown that there were some manifestations of nervous activity which required, in order to their complete elucidation, the recognition of an instinctive power in the brain, the whole subject has been since investigated by Dr. Carpenter, and has been highly fruitful of most important and varied knowledge. Dr. Carpenter has applied the term *ideo-motor* to the actions which will next come under consideration.

These have been already referred to at p. 22, when speaking of the results of the intelligence of the lower animals, of which such actions are presumed to form the sum. It has there been pointed out that a brute does not *determine* upon a course of action, but simply follows the one which its dominant idea has determined for it; so that a constitutionally timid dog would be, strictly speaking, *unable* to present a bold front to an adversary; while it is well known that similar timidity may be conquered by a man, and may be placed, by an effort of his will, below motives which it generally keeps in abeyance. But unless the will be diligently and habitually exercised, the constant presence of an idea will speedily undermine its power; and thus the actions of the vast majority of mankind are nothing but the instinctive expressions of their thoughts. Such actions are often called *impulsive*, in order to express their evident difference from those depending upon judgment; and they may be detected, by close observation, in many instances where they are not, at first, apparent. But besides what may be

distinguished as *ideo-motor conduct*, many single acts are accomplished by the instinctive working of the brain; and, among others, yawning, which may be excited by an idea as readily as by a sensation; that is, by thinking about it, as readily as by seeing it done. The movements of laughter or sobbing, in response to ideas of a ludicrous or a distressing character, and the sickness produced by the idea of a disgusting object, will occur to the mind of every reader, as furnishing instances of a similar kind. Many instinctive preservative actions are prompted by ideas as well as by sensations, a fact of which striking instances might readily be adduced; but the principle of instinctive action is so simple, and has been so fully dwelt upon with regard to the inferior nervous centres, that there is no necessity for any further amplification of it; and (after saying that an idea, in the brute creation always, and in man when the will is not exerted, is attended by a development of force, expending itself in the accomplishment of appropriate, but involuntary, movement) the action of the brain as the instrument of volition may be at once proceeded with.

It has been mentioned in another place, that volition is a power employed chiefly in the regulation of trains of thought; and in the commencement and continuance of voluntary movement. It is with regard to the former of these offices that the conditions of its activity must, in the first place, be examined; and it will be found that the human brain possesses a power to regulate its own operations, so as to entail the privileges, and the penalties, of moral responsibility, by

virtue of the action of the will in controlling the succession of its ideas.

It is said, in common parlance, that we call at pleasure any familiar idea into our minds; but the fallacy of this statement may be at once made evident, by pointing out that the idea is either present to our minds, or absent from them; and that, in the latter case, it could not be called, because having no existence to the consciousness; while, in the former, the call would be unnecessary. For, before we could desire to summon any idea, the idea itself must be there, or we should not know what it was that we wished to call. The power of will is, really, exerted in *retaining* an idea before the consciousness, longer than it would otherwise have been impressed upon it; and in determining which of the associations it excites shall be similarly retained, and so on; controlling the train of thought, not by *originating* ideas, or by calling them into existence, but by *selecting* from among those offered to its consideration. In this way, it is possible to reflect upon any particular subject, by rejecting all ideas that are foreign to it, and dwelling upon such as are germane; and the fruits or results of the reflection will depend partly upon the abundance and value of the ideas that have been previously stored up, and partly upon certain powers or faculties of the mind: as Comparison, Abstraction, and the like, with which different individuals are gifted, in different proportions, and in different degrees of intensity.

An apparent exception to this rule is furnished by the cases in which we remember a portion of a compound idea, but not the whole of it; and are conscious

of the deficiency, and of an effort to make it good. Thus, it is very possible to remember distinctly the personal appearance of an acquaintance, or the particulars of something that he has done, and to forget his name. In such a case, there is the consciousness that the idea exists, and the wish to regain possession of it; but the former depends upon a knowledge of the fact that every person has a name, and that, therefore, the individual in question can hardly be without one; while the latter is not attainable with absolute certainty. The will cannot recall the desired idea, in the sense that it commands a bodily movement; but it can keep before the mind ideas connected with the man, until either all the other associations with him are exhausted in a fruitless endeavour, or until the name comes in its turn with the rest.

To such a process as this, the word *Recollection* is properly applied, to distinguish it from *Remembrance*, which expresses the *unsolicited* return of our knowledge. The two, taken together, constitute *Memory*: a faculty whose importance may, perhaps, justify a short digression.

From occasional sentences in the foregoing pages, it will have been gathered that the ideas of every incident of past life, without exception, fall under the domain of memory; but that each one can only be brought before the mind by its association with another idea that has preceded it, and that either has been recalled by a similar process, or else newly excited by sensation. And it is evident that some past ideas may have been so trivial, and so unconnected, in themselves that there will be very few which can possibly recall

them ; none that are certain to do so ; and such will, perhaps, be unremembered, from the time when first forgotten, even to the end of life. Others, again, may have been present in connection with almost every act of existence ; and, when they are temporarily absent, every act of existence may serve for their recall. Thus, the idea of a friend may be brought back to us by the ideas of any of the things that have been done or considered ; of any of the places that have been talked of or visited, either with him, or in connection with his name ; or by any others which recall, however faintly, one of the former class to remembrance. The author has heard the difference cleverly illustrated by a comparison between the recall of an absent idea, and the discharge of a spring gun. If the machine be set, with wires proceeding from it on every side, a depredator cannot take many steps before it will inevitably be fired ; but if there be only *one* wire, he may walk within its range in comparative safety. Just so it is with ideas, there being some connected, so to speak, with but one wire in the garden of the mind ; and others whose wires are placed in every possible direction.¹ The illustration may be extended, however, by remarking that, as it would be very possible to place the single wire of a spring gun in such a manner as to guard effectually the only way of access to the enclosure ; while, nevertheless, the instrument would remain undischarged so long as a thief did not attempt to enter : so there are some ideas that are united by a very strong link to the single, or the few associations,

¹ Lecture on the 'Philosophy of Memory,' by C. R. Edmonds, Esq.

which they possess, and that will be infallibly and forcibly recalled whenever one of them is touched. This is the case with the associations formed by close volitional attention to unattractive subjects, such, for example, as chronology. If the date of a past event be forgotten, the associations with that particular combination of figures are mostly so few and faint, that efforts at recollection are unavailing; and the chronological student is obliged to provide against this difficulty by fixing his attention steadily and continuously upon each date, in connection with its event; and by thus binding them together so closely, that the one idea shall seldom fail to recall its fellow. But if two or more important events happened in the same year, as, for instance, the great plague, and the fire of London, the process of recollection is much facilitated by the double link; and a person who had forgotten the date of the plague might aid his memory by saying that it raged in the year of the great fire, and, therefore, in 1666. Anything remarkable in the repetition or arrangement of the units composing the number, such as the occurrence of three sixes in the illustration above, would furnish an additional clue; and would render it possible to retain that particular date after less original effort in its acquisition.

The two great aids to Memory are, therefore:—Familiarity and Attention, the first being the chief cause of Remembrance, and the latter being mostly concerned in giving the power of Recollection. The exercise of close and undivided attention involves a process of severe mental labour; and, on this account, whenever a thing is to be retained, especially by chil-

dren, it is highly desirable to call in the aid of familiarity; and to surround it with numerous associations, in order to increase the facility of recollection, by adding to the number of roads along which the mind may travel successfully in its search. The great means for the accomplishment of this end is to be sure that the thing to be learned is thoroughly understood by the learner, so that he may see the connections and the necessary truth of what he is taught; and that his mind may supply him with the knowledge of what must be, in answer to the question of what is.¹ The advantages of such a system are clearly shown by the ease with which languages may be acquired on any plan that commences with instruction in the vocabulary, as compared with those which commence with instruction in the grammar. By the former method,

¹ The principle of the above sentence was strikingly illustrated by a trivial incident which occurred to me, some time ago, during a visit at the house of a friend. I had been, for two or three days, a compassionate witness of the tears and disgrace of a little boy, who, having made some progress in the rudiments of summing, declared himself utterly unable to learn the preposterous and abominable *pence table*, with which books on arithmetic are commonly defaced. Guessing at the cause of his difficulty, I explained to him that forty pence were three-and-fourpence, *because* there were twelve pence in a shilling; and three times twelve, with four over, in the mysterious forty; so that, by dividing with twelve, he could calculate the answer to each question. The word *because* rolled the clouds of sorrow from his face; two or three illustrations and examples sent him with a light heart to his governess; and I had the pleasure of extricating my little friend from a slough of despond, in which he might otherwise have remained until the days of the expected decimal coinage.

a knowledge of the meaning of words, and of the distinctions conveyed by their inflections, being first acquired through the associations supplied by numerous instances: the knowledge of the inflection which denotes the accusative case, or the imperative mood, follows as a matter of course. By the latter, a knowledge of the inflections must be gained by the laborious formation of artificial and forced relations between sound and sense; and although this labour has been regarded by many educators as a healthful intellectual exercise, utilizing, by its beneficial effect upon the mind, the greater time required for the accomplishment of its avowed purpose, the author is strongly of opinion that this view of the question is radically erroneous. If it be admitted that the depth and variety of human knowledge cannot be fathomed by any individual, so as to leave him no opportunity for farther mental culture; if there be no fear that a student can exhaust even a single science, during the time when study is chiefly valuable to him as a stimulus to the development of his intellect; then it almost follows, that the things which are learnt should be learnt with the smallest possible amount of toil. To reject the aid of familiarity in the acquirement of knowledge, and to rest wholly upon the exercise of attention, is like bandaging the eyes of children learning to walk. For this, also, would be to deprive them of a natural guidance, and to throw them upon another, which, although highly useful as an auxiliary, would never supply perfectly the place of the first. Furthermore, there is a very grave objection to the employment of languages as a principal means of education; inasmuch

as they fix the mind, and occupy the memory, upon associations that are perfectly arbitrary and accidental, to the exclusion of such as are founded on resemblances in the essential nature of things. But it is only in the contemplation of the latter class that the powers of correct comparison, and just judgment, can be developed and matured; while the constant practice of dwelling upon the former will, necessarily, blunt the perception of the difference between a real and an accidental relation; and will, by confounding them together, tend to the fostering of narrow-mindedness, sectarianism, and bigotry. Against such an argument, it is unavailing to point to the history of past progress; because this is, in reality, totally irrelevant to the question. Undoubtedly, great men would be produced under any educational system that could be devised; but it may be fairly questioned whether more of them, and those better, could not have been formed under well-directed training. And not only so; but the work of education should be most carefully performed, because it essentially consists in the cultivation of mediocrity. Great powers make themselves felt; and, even by Solomon himself, the condition of the dunce was considered to be hopeless.

To return to the actual subject of discussion:—Some illustrations of the manner in which volition may be exercised to control the thoughts will be found on looking back to page 63, and to these it is unnecessary again to refer; farther than to say, that the habitual volitional course of ideas speedily ceases to require the exercise of volition, either for its commencement or continuance. A habit having been established, the

habitual ideas crowd upon the mind in the natural order of association; and those that have been constantly repulsed, cease to make themselves felt. Of necessity, the ways of thinking described as characteristic of certain classes and positions, must have been produced, in the first instance, by the exercise of the will; as in no other conceivable method could the habit have been formed. And such habits, when of long standing, control the course of thought with extraordinary power; and go far to nullify any single subsequent effort of the will to counteract them. Thus, a miser, who has voluntarily or determinately given up his mind to the pleasures of his favorite vice; if on any occasion he desire to be generous, will have no certainty of being able to effect his purpose, unless he effect it promptly. During any delay, the ideas which he has formerly cherished crowd in upon him; and, very frequently, will at last overpower his transient wish, and direct his actual conduct. The same thing holds good with the passions; and a man who frequently surrenders himself to anger will soon become unable to preserve his temper, even under a provocation which he has foreseen, and which it was his earnest desire to meet with coolness. Hence it may be concluded, that the duties of moral responsibility should be fulfilled, in early life, by the volitional formation of good habits of thought; and by the steady direction of the mind towards the highest principles and motives. This duty neglected, the once free agent is transformed into the slave of the passions he should have curbed in his youth; and may often, by the influence of the ideas, he has idly or wilfully suffered

to predominate, be hurried into actions from which he would have shrunk in his calmer moments, but the consequences of which he is most justly called upon to suffer ; although his former errors had deprived him, for the time, of the power to prevent or control his act. The man who surrenders his prerogative of volition sinks beneath the level of the lower animals, in having guiltily lost that which they never possessed ; and his deeds, like theirs, although guided by sagacity and intelligence to the attainment of his ends, are merely the expressions, in action, of his dominant ideas.

The power of the will to originate and continue muscular movements is seen in everything that we do in obedience to its commands, that is, in almost every action of our lives ; although it must be borne in mind that actions which have become habitual, such as walking, eating, or the exercise of a mechanical art, require the will only for their commencement ; and are continued, without its interference, in response to spinal or sensorial impressions, until it again steps in to stop the process which it had set in motion. The mathematician of page 30 was *set going* by his will ; for, feeling tired of his study, he went out to think in the garden, and immediately becoming abstracted, it may be said that his legs went on walking by purely automatic action ; and because they were not told to stop : the movements being *prompted* by the spinal cord, and *guided* by the sensorium. In the same way, a person reading aloud, or playing upon a musical instrument, or raising food to the mouth and masticating it, is not conscious of a determinate direction being given by him to each movement : the familiar

course of action, when once commenced, being sustained by the power of the instinctive apparatus ; and the effort of will being really directed, not to the regular succession of a certain series of movements, but to the general result which those movements bring about ; not to chewing the food, to striking certain known notes on the instrument, or to sounding the printed word ; but to the more general result of eating the dinner, playing the tune, or reading the book. The reverse of this holds good when the thing to be done is not familiar ; the will being then called upon to determine the successive steps of the process, and resting upon the accomplishment of each, before going on to the next. Take, in illustration, the tying together of two pieces of string in a weaver's, or other knot. At first, when the power of doing so has just been acquired, an act of will is necessary in order to assign its proper position to each successive twist ; but afterwards, and when dexterity has been attained, these twists fall under the care of the sensorium, or of the instinctive action of the brain ; and the will has nothing to do, except with the original decision that the knot must be made.

There are, however, many kinds of movement, in the sustaining of which the power of volition is actively concerned ; namely, all those where a determinate and continued effort has to be made for the attainment of some object which is steadily kept in view ; and in whose pursuit bodily or mental fatigue has to be disregarded. Every reader will be conscious of having made such an effort frequently, on occasions of greater or less magnitude ; but perhaps the best example of the

continued exercise of volition, is that furnished by the character and habitual conduct of King William the Third, as described by Mr. Macaulay.¹ In this phase of its operation, volition is the essential quality of strong minds, whether good or evil in their moral aspect; and it is by the exercise of the power which it gives, that such are enabled to pursue their ends with that steadiness, determination, and disregard of difficulties, which are the chief adjuncts to success in every department of exertion. It is said that Robert Bruce was encouraged to attempt his seventh and successful battle, by observation of a spider, in his place of concealment, who fixed its web on its seventh trial, after having, like the Bruce, been foiled six times. But it must not be forgotten that the spider, not having ideas, could neither be discouraged by failure, nor encouraged by success;—and that its sensorial perseverance, displayed equally after either, bore no resemblance in its causes to the volitional perseverance of the hero:—although in that day, and by many persons in our own, it would be thought of kindred to the spirit which it roused; but to which it appealed, only by exciting an idea of the probable consequences of continued exertion.

The power of the Will to restrain, or delay, instinctive movement, furnishes another marked channel of its activity, but will not require any lengthened notice in this place. It is doubtless partly due to the gradual weakening of the impression during its upward progress through the nervous centres; so that, when

¹ 'History of England.'

volitional force is at last excited, it is rather substituted for instinctive force, than exerted in overpowering it; according to a doctrine that will be more fully explained in the following chapter. However the result be brought about, it is often curious and striking, because there are not many people in whom it is manifested in any great degree. It is said that Prince Talleyrand once received a blow from behind, without the person to whom he was speaking at the time being made aware of it by any movement or change of countenance; the natural impulse to turn upon an assailant being completely subdued by the power of his will. Such cases are exceedingly rare, perhaps because any strong impression is likely to re-act partially through the spine or sensorium, for want of "time to think," as on the principle already laid down; and that the volitional force comes in afterwards, to carry on the course of action dictated by the judgment; which may, very possibly, be opposed to the first or instinctive impulse; and which may, in that case, completely supersede it.

It will now be necessary to return to the cerebellum: a portion of the nervous system which exercises an important influence over the movements of the body; but which is so subsidiary to the centres of force, that it does not in any way complicate or obscure their operations. Its principal office is to determine the regular and harmonious action of the muscles that move the body and limbs; and to call the right ones into play for the performance of any act that may be required. The will itself has no power over individual muscle, and cannot excite a single one of them to

independent movement. It is concerned with ordering the result only, and the cerebellum, like a major-domo, allots the task to the proper servants, and obtains their cooperation in its performance. In this office it is materially aided by a kind of feeling called muscular sense, which expresses the amount of resistance that the muscles overcome; and, consequently, the amount of force that they exert. The muscular sense, like the sense of touch, depends upon impressions conveyed through the common afferent nerves, and it has been supposed to be seated in the cerebellum,—a view that would include this organ in the group forming the sensorium. In man, the sense is chiefly useful, by leading to the correct appreciation, through an idea, of the amount of difficulty encountered in the performance of any voluntary act; the remembrance of this idea serving, as a guide, to regulate the quantity of force put forth on similar and subsequent occasions. It also, during the occupation of the other senses, keeps before the consciousness a necessity for continued muscular exertion, which cannot be sustained in the absence of a sensory impression. Hence, persons suffering from diseases which produce simple loss of feeling in any of their limbs, are obliged to supply the want of muscular sense, by the information gained through sight; that is, they can only walk whilst looking at their legs, and can only carry or grasp any object, whilst looking at their arms or hands. Under such circumstances, a mother has been known to drop her infant, her eyes, in a moment of forgetfulness, having been turned away from it; although she could hold it very well, as long as she saw

it (that is, felt it with her eyes,) to be there. The cerebellum, throughout the animals in which it exists, steadily increases in size and development with the activity and variety of the movements performed by its possessor; and reaches its highest grade in man, who, although inferior to many brutes in the energy and agility of his actions, is far superior to them all, from constantly maintaining the erect posture; which, especially during progression, requires the combined action of nearly every muscle in his frame, and involves a power of balancing to which no other animal can approach.

The cerebellum is not required for the direction of spinal movements, which are probably always produced by a discharge of motor-force, traversing *every* filament proceeding from the segment in which this force has been developed; so that the resulting action is determined by the distribution of these filaments, and takes place wherever they go. This distribution varies in different parts; the afferent nerves of the leg, for instance, passing to a portion of the cord which sends back branches to muscles in the immediate neighbourhood of the parts from whence they came; while, on the other hand, the portion receiving afferent nerves from the lung, returns its efferent nerves to the walls of the chest. It is probable that the simple movements by which sensorial impressions protect the organs that receive them, such, for instance, as sneezing, upon irritation of the nostril, or closure of the eyelid, at the sight of an approaching object, are accomplished in the same way; but, when the sensorial force has to influence other parts of the

body, as the arms or legs, it is probable that the cerebellum steps in to guide it, and to ensure, for the movement that is performed, its proper direction and extent. It assuredly performs this office for the forces generated by ideas or volitions; and it will be evident that such an organ is necessary to the correct working of the nervous system, because, if it did not exist, the motor force developed in the higher centres would pass down to the spinal cord; and, finding exit through *all* its efferent nerves, would throw the whole body into movement, instead of being concentrated upon a single member. But its presence does not, in any material degree, affect the *principles* of nervous activity, with which alone the present treatise is concerned; and it will, therefore, be unnecessary to devote any farther space to its consideration.

We may next proceed to the description of the second great division of the nervous system,—the sympathetic or ganglionic; which has been mentioned in the early part of this chapter, as controlling the processes of nutrition and growth. Its offices do not admit of being defined with the same precision as those of the cerebral and spinal portion; but still, certain operations have been observed, in which this division must necessarily be instrumental.

The sympathetic system consists of a number of collections or masses of grey matter, distributed in various parts of the body, and forming centres of activity to the nerves connected with them; just as the brain and spinal cord form the centres of the

nerves of motion and thought. These masses, or *ganglia* (*i. e.* knots), are connected together by a complicated series of fibres, or nerves, composed of tubular tissue, interlacing with each other within the ganglia, and ultimately distributed to the organs of digestion, to the walls of the blood-vessels, and to some internal involuntary muscles. The sympathetic nerves communicate freely with those of the spinal cord; filaments from each system passing into the other, and thus reaching parts of the body with which their own centres have no connection of the ordinary kind; but from which, by this arrangement, they are not entirely severed.

Before speaking of the manner and extent in which the sympathetic affects the organs that it supplies, it will be necessary to sketch the purposes that these organs fulfil, and the processes to which they are subservient; or, in other words, to describe briefly the manner in which nutrition and growth take place, independently of the nervous system.

For this purpose, it is necessary to premise, that every structure of the frame is constantly worn out and destroyed by use; and thus requires a daily and continual process of renewal, in order to keep the body in its perfect and entire condition. The rate at which the destruction of parts takes place is determined by their individual activity; the muscular system, as a whole, being renewed most quickly in persons of active habits; and the brain, probably, in those who lead sedentary and thoughtful lives. During the period of youth, each part of the body is formed in greater quantity than it is used; an inequality

which constitutes *growth*. When maturity has been attained, the waste and the renewal, for a certain number of years, balance each other with more or less exactness; and in old age, the preponderance of waste constitutes the gradual process of decay. Besides this general relation between the two, an excessive and unusual impulse may be given to them at any period of life, with regard to some particular organ, by any circumstances which demand from it increased or unusual exertion. The preponderance of either will then be determined by the vigour or weakness of the system generally; and by the amount of nourishment that can be taken. Under *excessive* exertion, there is always danger that the supply of new material will be exhausted, before the loss of structure is entirely repaired; and, if this be so, a gradual weakening and ultimate decay of the organ concerned will be the necessary result; although the last may often be prevented, by taking timely warning from the first.¹

¹ This kind of injury is often sustained by the brain; and especially under the operation of that collegiate system which forces young men of moderate intellectual power into competition with those of very superior endowments to themselves; and induces them to strive, by the laborious acquisition of knowledge, against the higher faculties of the mind in others. The names contained in the honour lists of an university might fairly, perhaps, be arranged into two classes, of which the first would be exemplified by men of great natural power, who, in their academic position, do but assert the prerogative of intellect:—the second, by men who have climbed with dizzy brains to an eminence on which they are unable to stand; and who, when no longer sustained by the excitement of the strife, fall back, with shattered nerves and broken health, below that mediocrity which they should not have aspired

When, however, the system is equal to the demand made upon it, the organ will increase in size and development with its increasing work ; and will soon perform easily what was once a laborious task.

The manner in which this decay and renewal are accomplished depends upon the minute structure of the body ; which is composed, in nearly all its parts, of exceedingly small cells, or membranous bags, containing fluid, and having within them, or on their walls, the germs of other cells like themselves. They constitute the principal bulk and the essential part of all the organs of the frame, being bound together, and retained in their places, by what is called connecting tissue. Their shape is various, and depends upon the way in which they are arranged with regard to each other, and upon the degree of compression to which they are subjected. When placed end to end, to form muscular fibre, they are more or less cylindrical with flattened extremities ; when lying loosely in the soft gray matter of the brain, they are sometimes regularly spherical, and sometimes send forth branching prolongations. When in a confined space, their soft walls yield to pressure, and they become regularly polygonal. Under all circumstances, they are too small to be visible to the naked eye (from 300 to 15,000 of them being required, ranged in line, to occupy the length of an inch), and

to leave. The author has witnessed some melancholy examples of the latter class, which he cannot but regard as the natural and necessary results of these premature mental contests ; and which, in his judgment, far outweigh the benefits produced by them ; —on the supposition that real ability needs no such stimulus to its activity, and no such channel for its display.

it is, therefore, solely by the aid of the microscope that physiologists have been made acquainted with their very existence.

Each one of these cells must be regarded as possessing a perfectly independent *life*, altogether distinct from the life of the body of which it forms a part; but, like it, exhibited in the successive stages of growth, maturity, and decay. Each cell, on arriving at maturity, exercises some particular endowment special to itself, that is to say, special to the kind of cell of which it is an example; and, having performed this office (probably only once), perishes;—its broken fragments passing into the blood; and the germ or germs which it has left behind, growing to supply its place. Thus, the cell of muscle has no other function than to contract; and the cell of grey nervous tissue none but to develop a peculiar kind of force; while other structures of the body possess, in like manner, cells of a description proper to themselves, and limited to the performance of their several operations. The germs formed by these various cells have, when fully grown, precisely the same powers and characters as the parent from which they sprang; and therefore, in the healthy state, each structure is, when wasted, replaced by new material of a kind exactly similar to the old; while, during the progress of the change, the minuteness of the individual cell prevents there being any appreciable breach of continuity from its loss.

The growth of a cell to maturity requires that it should absorb a sufficient quantity of its proper nutriment, which is, in all cases, furnished to it by the blood; and, as the blood has thus to supply demands

of various kinds, from cells of different offices, it is necessary that it should contain a sufficiency of the materials required by all; and that they should possess a selecting power, so as to absorb only what is proper for themselves. In this manner, each kind removes from the blood its own materials, and leaves behind the materials adapted to the support of others; while the blood itself is kept supplied by the food, the quantity and proportions of which should fall under the direction of *appetite* and of *taste*.

Besides this process, to which the word Nutrition is commonly limited, there is a slight modification of it which has received the name of Secretion (*i. e.*, separation), and which consists in the growth of cells not destined to add to the solid structures of the frame; but either to serve some useful purpose *within* the body; or else to be immediately removed from it, on account of the noxious character of the materials which furnish them with the means of growth, and which it is their special province to take away. The two kinds of product are distinguished as Secretions, and Excretions: the former being chiefly made from the alimentary materials, and the latter chiefly from the *débris* or fragments of cells that, in their perfect state, have aided to form the solid structures of the body; which *débris* cannot be re-adapted to their original uses, and would exert a highly poisonous action if retained within the system.

The organs by which secretion is performed are called glands; and are, in their various kinds, very widely distributed. Their size varies from that of the liver, to a little depression requiring the aid of a mag-

nifying glass for its discovery ; and it generally holds an inverse proportion to their number, the liver being a single organ, and the small glands being extremely numerous. In each gland cells are formed, which, when mature, escape through openings provided for the purpose, into the different channels to which their different positions give them access ; so as either to exercise their proper offices, or else to be speedily carried away. Among the *secretions* best known are the saliva, by which food is moistened during the process of mastication ; the gastric juice, by which it is dissolved in the stomach ; the mucus, by which the delicate skin lining the mouth is protected from the action of irritating food ; the wax, which has been already mentioned as guarding the passages of the ear against the intrusion of insects ; and the tears, which, constantly formed in minute quantity for the purpose of cleansing the surface of the eye, are greatly increased under the influence of some emotions. The *excretions* are best illustrated by the action of the kidneys, and of the glands that form the perspiration ; which, however, besides their excreting function, serve yet another purpose, by acting as simple filters to drain off an excess of fluid from the blood, so as to regulate its actual quantity, and to prevent the blood-vessels from becoming improperly distended. The bile, formed by the liver, occupies an intermediate position between the two classes of product, being a highly useful and necessary secretion in aid of the digestive organs ; and, at the same time, an excretion whose elements are of the most poisonous character.

From the circumstance that the secretions are

required for constant use, and that the elements of the excretions are highly injurious, it follows of necessity that any check to the formation of either will have a prejudicial effect upon the health. And so much is this the case with regard to the latter class, that a total cessation of the action, either of the skin, the kidneys, or the liver, has, in many instances, proved speedily fatal; notwithstanding that there exists a sort of relationship between these organs, by which any one of them is rendered equal, in case of need, to a partial and vicarious performance of the functions of either of the others; so that, if the cessation depend only upon a temporary cause, the fatal result may, through their means, be averted. But, without reference to cases so severe as these, it may be stated that arrest or disturbance of secreting functions is among the most ordinary causes of illness; either by leaving the blood unpurified, or by withdrawing, from the digestive or other organs, something essential to the due performance of their operations.

The only conditions that can be considered absolutely necessary to the accomplishment of the processes just described are, on the one hand, the existence of a cell, or cell-germ, as a starting-point; and, on the other, the supply of sufficient material for its growth. These conditions, as such, are evidently independent of nervous influence; but, nevertheless, this influence is exerted in a most potent manner upon the whole apparatus of secretion; all glands being plentifully supplied with sympathetic nerves, and with blood-vessels upon whose walls these nerves ramify freely, determining, as is believed, their calibre from

time to time. Here alone (as the calibre of the blood-vessel will determine the quantity of fluid that can traverse it,) is an indication of the way in which the sympathetic system may control the *quantity* of a glandular product; and its influence upon the *quality* is shown by the effect of mental changes upon almost every secretion of the body. The proper office of the sympathetic with regard to the glands is, probably, to harmonize their operations, and to call each one into activity when its product is demanded by changes in other parts; supplying, at the same time, by expansion of the blood-vessels, the aliment required for meeting an increased demand; and shutting off the supply, by their contraction, when the state of activity is to be succeeded by comparative repose. It is believed, also, that these nerves act an important part, in stimulating, by the force which they transmit, the glands to *healthy* activity; and in thus ensuring, from those organs, a proper supply of perfect and well-formed secretion; instead of a product which might, without such aid, either be half finished, or formed in the largest quantities when the demand for it had ceased.

The quantity of blood admitted to each organ being thus under the control of the nerves, a provision is still required by which the fluid shall be driven through the channels which are sometimes widened for its reception. This provision is supplied by the heart, a hollow muscle, that receives the blood into its cavity, and then, by its contractions, impels it along the blood-vessels. The muscle of the heart is not subject to the control of the will; and does not contract in

response to sensations ; but receives its nerves entirely from the sympathetic system, and is kept in motion by a force transmitted through them.

Involuntary movement is required also in a layer of muscle that surrounds the alimentary canal ; and by whose contraction the food swallowed is carried onward for the successive completion of the different changes it has to undergo. This muscle, also, is supplied by the sympathetic system ; and its action is precisely analogous to that of the heart.

The parts which are dependent upon the sympathetic system for their nerves are, generally speaking, devoid of sensibility ; although, as they all, through the medium of the sympathetic trunks, receive and transmit efferent and afferent spinal filaments, they can, under certain circumstances, call the sensorium into action. Thus, the stomach, in the healthy state, does not record the impressions made upon it ; flavour and contact being alike unable to excite sensation. But, when inflamed, it becomes acutely sensitive, the smallest morsel that is swallowed causing intense pain ; and it is believed, both with regard to this and to other organs, that the spinal nerves pass through sympathetic ganglia, for the express purpose of interrupting and diffusing the impressions which they would otherwise convey ; these impressions, however, passing on when very powerful or unusual, and evidently then fulfilling a conservative purpose. For instance, the presence of food in an inflamed stomach, would be highly injurious to it ; and nature, therefore, enforces abstinence, by the suffering which even a mouthful would create.

The motor-power conveyed through the sympathetic nerves is, like the faculty of sensation, supposed to be entirely due to the spinal filaments which they contain ; leaving only the perfect performance of each nutritive or secreting function, and the maintenance of harmony between them all, as the proper office of the ganglionic system. But, even in this, it is, as will be seen hereafter, liable to be disturbed, by the agency of cerebral or of sensorial changes.

CHAPTER II.

NERVOUS FORCE, INSTINCTIVE AND VOLITIONAL.

IN the foregoing chapter, mention has frequently been made of *force*, as the spring of all the operations of the nervous system ; and, therefore, in order to the clear comprehension of these operations, it will be necessary to devote some space to the agent by which they are excited, and to the circumstances which are favorable or adverse to its development.

The word Force, is one of very extensive application in the sciences ; and is used not only to express the hidden source or cause of motion, or active change of any kind ; but also the cause which converts existing motion into rest, and which maintains quiescence when that state has been arrived at. Thus, force has been defined to be that which causes motion, resists motion, or changes motion,—and we are familiar with its operation under several different aspects and names. In the form of Heat, we see it produce expansion, or increased bulk, in all known substances, followed by contraction as the heat is withdrawn. In the form of Electricity, it alternately attracts and repels substances brought within its influence : as

Magnetism, it attracts and repels in a more limited sphere of operation; and as Chemical Affinity, it causes substances, under certain conditions of contact, to arrange themselves into new forms and combinations.

Until recently, all these different manifestations of Force were regarded by philosophers as the effects of distinct agents, bearing either no relation, or at least an unknown relation, to each other; and these agents were commonly supposed to be, in some sense, material. Thus, Electricity and Magnetism were spoken of as *fluids*; Light and Heat were ascribed to the undulations or vibrations of a subtle ether, which was supposed to occupy space, and to permeate and fill the pores of all terrestrial substances; and Chemical Affinity was regarded as a quality or property, inherent in all those bodies, by which its results can be exhibited.

But it has been shown, by the sagacity of Professor Grove,¹ that these views are, probably, erroneous; that the various physical *forces*, as they were formerly called, are the varied forms under which one single agent may declare itself; and that these forms are so correlated, or reciprocally dependent, as to permit the production of each of them by the transformation of another. Presupposing the existence of Motion, which would continue for ever if it received no check, Professor Grove shows that, when it is impeded (as by the friction of the moving body against another), a portion of the force by which it had been maintained

¹ 'The Correlation of the Physical Forces,' 2d edition, 1850.

ceases to display itself as Motion, and takes the form of Heat: the substance moving less rapidly, but becoming warmer. And this Heat, if it fall upon a thermometer, causes the mercury to expand; thus disappearing as heat, and being once more manifested in the form of motion. There is, moreover, a constant relation of quantity between the two modes of force: the heat produced being in proportion to the energy of the original movement, and the degree of resistance opposed to it; and the movement of the mercury being in proportion to the degree of heat.

Professor Grove's theory may be summed up, by saying that, whenever any form of force, whether Motion, Heat, Electricity, Light, Magnetism, or Chemical Affinity, ceases to act or appear in its original character, it is not exhausted or destroyed, but is simply converted into one of the other forms; and continues to act, without any loss, but in another manner. On this supposition, it is evident that the total amount of force operating upon the universe can never vary; although more of it may assume some particular form, at one time, than at another.¹ It is evident, also, as the presence of the force that we

¹ For instance, there being reason to believe that our globe has been subjected to great heat, at some former period of creation, it may be presumed that Heat was the chief form of force, as at that time manifested. But it is probable that some of this heat took the form of Chemical Affinity; and that hence may be explained the existence of compound substances, which, after their formation, have been fused, and have run into holes and clefts of rocks, as if into moulds. Malachite furnishes a good example, its blocks being simply natural castings of an oxide of copper.

now behold, can be explained only on the supposition of other force pre-existent to it, and by which it has been called forth;—motion being immediately suggestive of pre-existent motion; heat and light, of pre-existent heat and light;—that, if this tracing backwards be continued, by the aid of mental conception, to that time which is described, in the language of Scripture, as “the beginning,” the conception of pre-existent force, as such, becomes then no longer tenable; and we are compelled to seek for its origin in the creative fiat: “Let there be Light.” Hence, in the language of Professor Grove, “Causation is the will of God;” and in that of Dr. Carpenter, “an inquiring mind is led by the consciousness that by its own volition it can give rise to a force which is capable of operating upon the material world, to look to an Intelligent Will as the ultimate spring of all those changes for which it can find no other source, and to regard the forces of the universe in general as so many modes of operation of the one Omnipotent and Omnipresent Mind. Viewed under this aspect, therefore, all the phenomena of nature which have not their origin in the mental power of subordinate beings, must be considered as the immediate exponents of the will of the Creator.”

Refraining from a more minute description of the relations between the modes in which force operates upon inanimate matter; and referring those readers who desire more explicit information to the source which has been already indicated; our attention must next be directed to a mode which is displayed only in living bodies, and is called vital force or vitality. By

the operation of this are accomplished all those actions or changes which constitute *life*; just as the attraction of iron is accomplished by the mode of force called Magnetism. And, it having been already said that the body is built up of myriads of minute cells, each possessing an independent existence, it will be seen that vital force must really be exerted in the maintenance of cell growth; that is to say, in conferring, upon each germ, the power of applying nutriment to its own increase. The office, in the economy, of the mature cell or its contents, is, in some cases, perhaps, simply chemical, and might be imitated in a laboratory; but the *formation* of the cell can only be accomplished in a *living* body, and is directly dependent upon *vital force*.

Now it has been pointed out by Dr. Carpenter, that this vital force bears to the physical forces a relation similar to that which they bear to each other; and that it is, in fact, only the expression in another form, of the Heat, Light, Electricity, or Chemical Affinity, which have been brought to bear upon the cell-germs. A seed, if secluded from these agents, will remain unchanged for an indefinite time; but no sooner is it brought within their influence than the process of growth immediately commences;¹ and is continued at

¹ The growth, in an English garden, of raspberry-seeds found in the stomach of an Egyptian mummy, who, it was supposed, had eaten the fruit shortly before death, furnishes a good illustration of the text. Many similar instances are mentioned in an essay by Mr. Robert Chambers, published in that gentleman's collected works, but to which the Author has not present access. He will, however, quote the following from recollection. In digging a well,

a rate proportionate to their intensity. In the animal body, too, the vital force, derived in the first instance from the parent, is fed and maintained by the introduction of force in other forms; by heat and light, from the sun, and from artificial sources; and by chemical affinity, from the various compounds used as food.

Of the exact nature of Force it would be impossible, in the present state of knowledge, to say anything with certainty; or, indeed, to form any distinct conception whatever: although it may fairly be concluded that all those facts which were once urged in support of the hypothetical fluids or ethers, may be explained by the qualities of the substances on which force is exerted, rather than by the qualities of force itself. For instance, the light produced by the agency of electricity, is not a luminous fluid; but depends upon the combustion of a minute quantity of the substance from which the electricity is given off: and the reflection or radiation of heat and light is, in reality, the reflection or radiation of the particles of matter which those forces affect. With regard to the transformation of the modes of force into each other, the weight of evidence is in favour of ascribing this to properties

at a place in Scotland, forty miles distant from the nearest seashore, the labourers discovered, far below the surface, a vein of what appeared to be *sea-sand*; which they placed, when raised, in a heap by itself. After a while, this sand was scattered over the adjacent ground, on which there appeared, in the ensuing spring, a plentiful growth of a maritime plant, the beach plum: whose seeds had evidently been contained in the sand; and had, in all probability, been buried with it at the time of the deluge.

inherent in the substances in which the transformation takes place; and it is supposed, therefore, to be a property of matter to change Motion into Heat, when the former is impeded by friction of the moving body against other matter like itself; and into Electricity, when impeded by friction against matter of a dissimilar kind. The practice of certain savages, who kindle a fire by rubbing two pieces of wood together; and the construction of the ordinary electric machine, in which a velvet rubber, covered with amalgam, is applied to a cylinder or plate of glass, will illustrate these familiar kinds of change; and, by a parity of reasoning, the conversion of heat, light, or other modes, into vital force, is believed to be due to a property of the *living* cell within which the conversion is effected. These transformations of force are not, however, by any means of invariable occurrence in all material substances; for there are many which permit it, at least in some forms, to traverse them without change; and which are said to be transparent, transcalescent, or conductors of electricity. A similar power of unchanged conduction, with regard to vital force, may safely be attributed to the various nerve trunks of the living body.

In the vegetable kingdom, each cell of which a plant is composed transforms for itself the amount of force required for its own operations; so that, when the solar heat and light supply the necessary external conditions, all portions of the plant that are exposed to their influence are roused into full activity: the whole amount of force received being distributed equally throughout the parts on which it falls;

and being applied to the performance of actions for which the plant either contains all the necessary materials within itself; or is constantly and regularly furnished with them from the soil, or from the atmosphere. The vital operations of the vegetable, therefore, are subject to no check, except from the withdrawal of force; are instantly renewed by its return; and are performed with an energy strictly proportionate to its quantity. By these facts may be explained the drooping of many plants at nightfall; and also the great luxuriance of tropical vegetation, as compared with that of colder climates. Under a burning sun, plants not only attain a magnitude unequalled in other situations; but such of their parts or products as possess medicinal or poisonous qualities, are formed in the highest possible state of activity; while, when produced in a less elevated temperature, they are found to be comparatively inert. But in animals, an equal distribution of force would be irreconcilable with the conditions of their existence; because they are dependent for their alimentary materials upon irregular and uncertain sources of supply; and have frequently to exert their powers of motion and of thought, before even these sources can be made available. Hence, the alternate activity, and quiescence, of their several functions requires that force should be chiefly exerted, now upon one organ or set of organs, and now upon another; as upon the stomach during the period of digestion; upon the muscles during bodily exercise; and upon the brain during the process of thought; while, if there were sufficient to keep all these parts at work simultaneously, the supply would necessarily

be redundant under any circumstances that afforded temporary repose to either. And, therefore, it is found, as might have been imagined, that the chief functions of the animal body are antagonistic to each other; and that no two of them can be energetically performed at the same time. A full meal produces indisposition, alike for bodily or mental exertion; and the performance of either, immediately after it, would be certainly followed by dyspeptic symptoms; thus clearly showing the inability of the human force for the simultaneous accomplishment of two important functions.

In the animal, as in the plant, each cell is adequate to the formation of a certain amount of vital force; so as to retain its own independent life, and to pass through its successive stages of growth, maturity, and decay. But the demand for occasional activity requires that this amount of force should receive an occasional increase; and that the increase should take place at the right time, and be withdrawn on the cessation of the demand. These necessities are provided for by the nervous system, the cells of whose grey matter seem to have the special office of developing the vital, from the physical, forces; and of liberating this vital force by their own destruction, in order that it may be directed upon other parts of the body. The nerve cell is maintained in its mature condition by a certain quantity of force; and this, when the cell breaks up, under the influence of a change in the centre of which it forms a part, is conducted along a nerve trunk, either to display itself as movement, or to accelerate the growth of structural or glandular

cells, which were being more slowly formed, under the sole influence of the vitality inherent in themselves.

The nervous centres, therefore, collectively considered, may be looked upon as a laboratory for the formation of vital force; and the efferent nerves as the conduits by which this force is carried to the parts where its action is required. The whole apparatus may be roughly likened to a reservoir containing gas, from which pipes are conveyed to the various rooms of a dwelling-house. These rooms, in the dusk of evening, contain an amount of light which will typify the amount of vital force possessed by each cell of the body in its individual capacity; and which would render it possible to walk in them without danger of falling over the things they might contain. But if one of the rooms were required for the exercise of an art or calling, it would be necessary to light the gas, just as it is necessary, during the process of digestion, to aid the inherent vital force of the stomach by an additional supply, conveyed through the sympathetic nerves; and which, like the gas, is turned off when its purpose has been fulfilled. Lastly, it is evident that the greater the number of jets lighted, the less brilliant would be the illumination afforded by each; and it is easy to conceive a reservoir bearing such a proportion to the house, as only to allow of one room being thoroughly lighted at once. This is the ordinary condition of the nervous centres, which are unable, generally speaking, to supply force for two dissimilar operations at the same period of time.

The force developed by the cells of the nervous centres differs from that of the other parts of the

system chiefly in being more than is required for any local purposes; and therefore, in order to distinguish it from that which suffices only for the bare perfecting of the cell by which it has been transformed, it has received the special prefix of *nervous*, in contra-distinction to *vital* force.

The formation of nervous force is supposed, therefore, to be effected by the disintegration or destruction of a portion of grey tissue; which, in its former mode of operation, it had held together, and which has to be replaced by the nutritive processes. This supposition leads at once to the idea of 'a limitation of the gross amount of force which can be called forth; and also to possible differences in this amount, in different individuals, whether of similar or of diverse species. For it is evident that slight variations in the composition of the nervous cell might very much increase, or diminish, the quantity of force it was capable of developing; and, also, that differences in the absolute number of cells would have, for the whole nervous system, a similar effect. In support of the first of these positions, it may be mentioned that the actions of brutes are more energetic than those of man: the strength of some wild animals being prodigious, and that of the domestic ones being by no means contemptible, and always much greater, weight by weight, than that of their masters. Dr. Carpenter illustrates this by reference to the chimpanzee, which (he says), "according to the statements of the negroes who have encountered it, is far more than a match for any single man; and is almost certain to destroy any human opponent, once within his

grasp." The statement with regard to the absolute number of cells is almost self-evident; and both this and the former are abundantly exemplified by the difference between different men, in point both of bodily and mental vigour. The former depends, it is true, in some measure, upon the size and condition of the muscles; but, at the same time, the weak muscle is seldom or never urged to the full exertion of which it would be capable; and its inferiority to the strong is probably due, for the most part, to the inactivity resulting from a deficient supply of nervous force.¹ And the mental vigour, as contrasted in persons possessing equal, or nearly equal, sources of information, must evidently depend upon the energy of the cerebrum; and it presents, under such circumstances, diversities sufficiently wide to indicate much variety of original conformation.

It is necessary, therefore, to recognize certain conditions which are essential to the formation of nervous force; and of which some are physical, and supplied from without, others vital, and supplied from within. Of the former, an abundant supply of the alimentary materials of cell growth, in the shape of wholesome food and pure air; and a sufficiency of the physical forces, heat and light, may be reckoned the most

¹ The author was well acquainted with a gentleman, now dead, who, with very small but firm muscles, possessed an unusual degree of personal strength and vigour, due, probably, to the energy of his nervous apparatus. He was in the habit of performing, with great rapidity of movement, feats of strength much beyond the power of others, whose muscular systems were far more highly developed than his own.

important. The latter are illustrated by those striking differences in the conformation of individuals which are expressed by the word *temperament*; and which seem to indicate original or acquired differences in the properties, or force-transforming powers, of the cells by which their structures are built up.

The nervous force of the human subject is exhibited under two distinct forms, whose names have been taken for the heading of this chapter, and whose operations are often curiously blended together. They both of them produce the same evident effects upon the body, —such as muscular movement, and the formation of ideas,—but they differ greatly in several important particulars. The actions prompted by instinctive force are very energetic; are seldom attended by fatigue or sense of exertion; are performed independently of any knowledge of their purpose; require no guidance from experience; are sometimes perfectly uncontrollable; and often essential to life or safety. The actions prompted by volitional force are comparatively languid; speedily induce fatigue; are preceded by definite knowledge of their purpose; cannot be successfully accomplished without more or less practice; are always perfectly controllable; and are never essential to immediate safety, except when they supersede an instinctive impulse. In their origin, and in each of the foregoing particulars, they may be compared and contrasted with advantage.

To a superficial observer, conscious, on the one hand, of the operations of his own will, and, on the other, of the machine-like character of the instinctive actions, the origin of these two modes of force would

appear to be widely different. He would, in all probability, refer the first of them to his spiritual nature ; and the second to his material organization ; regarding volition as an essential attribute of mind, and instinct as an expression of " laws written upon the nervous pulp." But, as an endeavour will be made to show, the two agencies do not admit of being thus distinguished from each other.

In the first place, it may be pointed out, that there exists a correlation, or state of reciprocal dependence, between instinct and will, analogous to that already mentioned, between motion and heat ; each, under certain circumstances, being capable of producing the other, so as to be replaced or superseded by it. Every reader will be able to remember instances in which the first effect of a novel idea has been the development of an instinctive impulse, sufficiently powerful, perhaps, to prompt the commencement of some action, whose continuance was immediately prevented, at the suggestion of prudence, and by the interposing mandate of will ; the instinct, in such case, disappearing altogether. Conversely, the things that are done every day in obedience to the dictates of habit, and without a distinct consciousness of, or desire to do, them, depend upon ingrafted instincts produced by the frequent repetition of volitional efforts, and illustrative of the opposite kind of transformation. It is found, moreover, that the two forces bear an inverse relation to each other, in regard to their habitual energy,—either the instincts, in any individual, commonly overpowering the volitions ; or, contrariwise, the volitions overpowering the instincts ; a state of

things that could not exist if they were independent and distinct; but which, in conjunction with other evidence, justifies the belief that each kind of force is a transformation of that which had been exerted in maintaining the life, and integrity, of the cells of the grey matter of a nervous centre; and that the difference between them is dependent upon a difference in the exact character of the cell battery, from which they respectively proceed.

It has been stated in the foregoing chapter, that the design or adaptiveness manifested in the actions of insects, or in instinctive actions generally, must be regarded as an evidence of Creative Intelligence, manifested through the intermediate agency of a living apparatus contrived for the purpose, but not gifted with any power of designing or adapting for itself. And, if all the vital actions within our range of observation had been of an instinctive character, so that men had never, from their own consciousness of volition, ignorantly imagined it to exist in many cases where it does not, then the relations between the vital or instinctive force, and the structures through which it operates, would have been at least as clear, and as fully understood, as are, at present, the relations between electricity and glass, or between electricity and the metals; the vital force, like the physical, being regarded as an expression of Creative sustaining force, modified in its immediate effects, in either case, by the nature of the material through which it was displayed. But, if it be remembered, that our ultimate idea of force at all, ascribes to it the form of Will,—the Will of the Divine Creator,—it becomes at once evident, that

the idea of a material substance, having the property of restoring force to its original form, does not, at least, involve any contradiction, or make any excessive demand upon our belief. Such, then, is probably the true nature of Human Will; namely, that it is a reproduction of Creative Will, either in its original form, or in some approach thereto; and assuming that form by virtue of a property, with which the grey matter of the human brain has been endowed. In its operation upon the world, the Human Will, as compared with its Great Original, is confined within very narrow limits, by the weakness of the instruments with which it has to work, and by the imperfection of its accompanying intelligence; as well as by the limitation of the gross amount developed, in consequence of the small quantity of matter (cerebrum) possessing the necessary property. It amply fulfils, however, that which must be regarded as its final object, in conferring a degree of directive power, over both thought and action, without which moral responsibility could not have been imposed; and which, on this view of the case, must be regarded, among created beings, as the prerogative of intelligent man alone. The brute, possessing the faculty of ideation, dwells upon the thoughts that impress themselves most strongly upon its mind; the man, gifted with volition, selects the idea that shall be prominent. The brute cannot prevent its present idea from governing its conduct; while the man, by virtue of his will, can either act in opposition to the plainest dictates of his reason and experience; or can control his most stormy passions, by an appeal to those higher motives, which, although all-

powerful when aroused, would never spontaneously present themselves to his consciousness.

An essential part of the doctrine of the correlation of forces, is that which relates to the element of quantity; and which teaches that, whatever modes of activity any particular amount of force may pass through, it will be recoverable, without loss, in the form in which it first came under observation. But it by no means follows that this amount of force will act, in all its modes, with the same intensity in any particular direction; and hence we find, that when volitions are excited in immediate succession to ideas, the actions they cause are not nearly so energetic as instinctive ones, resulting from the same ideas, probably would have been. This difference may be regarded either as expressing the diminished effect upon the muscular system of a certain amount (A) of volitional force, as compared with an equivalent amount (B) of instinctive (equivalent, that is, inasmuch as one may be converted into the other); or it may be regarded as a consequence of the fact, that, whereas the instinctive force is liable violently to discharge itself in action, without regulation from the agent; the volitional force may be kept back for a time, and doled out, as it were, in accomplishing just so much as will fulfil the object in view. It is probable that both these causes are brought into operation; but, however this may be, the greater power and longer duration of movements prompted by instinctive force, as compared with those prompted by volitional, is a matter of common observation. Indeed, the sense of fatigue during action is almost limited to the latter class of operations; and is

never felt in connection with many of the former. For instance, the act of breathing is performed, on an average, about fifteen times in every minute, throughout the whole of life; and yet, in the healthy state, no one was ever tired of doing it. But any voluntary movement, performed at the same rate of speed, and with the same regularity, would soon become excessively wearisome, and would entail an imperative necessity for rest; the source of fatigue not being in the movement itself, but in the exercise of volition required for its continuance. And, as any regular series of muscular movements may be soon rendered independent of the will by repetition, and dependent only upon the reception and propagation of spinal or sensorial impressions, so the fatigue attending upon them soon ceases to be felt. This fact, proved by many callings requiring manual dexterity, may be exceedingly well illustrated by the experience of the women who were employed, before the introduction of machinery, in folding envelopes for letters. These women, after a few days of practice, reached the maximum of speed which the human hand seems to be capable of attaining; and in which the variation for different individuals is so slight, as to range only between thirteen envelopes and fifteen, in two minutes. When this degree of dexterity had been gained, the distressing sense of fatigue experienced in acquiring it soon and totally disappeared; the regular movement being continued uninterruptedly during the hours of labour, and with very little sense of exertion. The greater absolute energy of instinctive movements than of volitional, is made manifest by the extraordinary

efforts which have been called forth by the instinct of self-preservation, in response either to sensations or ideas; but certainly without either aid or hindrance from the Will. Under such circumstances, leaps have often been accomplished, which no volitional exertion could have brought within the range of possibility; and many other remarkable things have been done, all tending to the safety of the individual, and all far beyond his ordinary powers.¹ The expenditure of force required for these efforts, is necessarily felt by the system when the emergency is over; and its loss may doubtless contribute, in some measure, to the sudden sickness and faintness which often follow upon prompt and decided action in moments of peril; and which have already been regarded from another point of view. But, even when an instinctive action is, as sometimes happens, sustained, until at its cessation exhaustion is felt, or faintness supervene, still, little sense of fatigue is experienced during the period of exertion; and it is probable that, when purely instinctive, the vigour of the effort, while sustained at all, is in man scarcely liable to flag. Precisely the reverse

¹ There is a well authenticated anecdote, to the effect that an officer serving in India was once surprised, when breakfasting in a tent supported by a central pole of bamboo, perfectly smooth, and many feet in height, by the sudden entrance of a tiger. The officer sprang to the central pole, climbed to its summit, and remained there in security, until the departure of his uninvited and unwelcome guest. But on endeavouring (without the tiger) to repeat this exploit, he could neither do so himself, nor could he find among the officers or men attached to the station, any one able to ascend a single yard upon the slight and slippery pole.

of this will apply to volitional exertion, in which the sense of fatigue is soon felt; and, if the effort be continuous, steadily increases: the actions becoming weaker and weaker, until they are of necessity altogether abandoned, in order that the failing powers may be renovated by nourishment and repose.

It is evident that the amount of either force which can be put forth under necessity, must always vary with the organism of the individual who is called upon to exert it; but the effect of volitional force is subject to another cause of variation, in the greater or less practice in its use for any given purpose. For the two forces may either be placed in antagonism to each other; or they may be exerted harmoniously and in unison: the former occurring when on some occasion the will resolutely acts counter to the habitual course of conduct; and the latter, only when habit comes to the aid of volition. So that, as a succession of effectual volitions will constitute a habit, the more frequently a thing has been done, the easier it becomes; until at last an exertion of will is required, in order to refrain from it, when once the usual stimulus has been applied. In the case of bodily movements, it may be presumed that the muscles themselves possess a greater aptitude for action in accustomed combinations and in a familiar direction; but, as it has been stated in the foregoing chapter, the antagonistic or combined action of the two forces may constantly be seen in the purely intellectual operations; and also in the relative intensity of the various moral feelings. Under the name of *idols*, Bacon has described certain erroneous modes of thought by which the minds of most

people are warped in some degree; and which are, in fact, but the expression of an *instinctive* tendency, in their ideas, to travel upon a beaten track. This tendency it is that constitutes prejudice; and, while even the philosopher is compelled to watch closely for its insidious advances, and to strive earnestly against its power, we may always recognize it as a chief element in the opinions of the unthinking and the ignorant. The moral feelings are under a precisely analogous law; each gaining strength by habitual predominance; each becoming torpid under habitual suppression; so that, in all his mental and corporeal actions, man is called upon constantly to exert his prerogative of will; unless he be content that the passions of his animal nature, the crude notions of his immature intellect, and the actions of his forgotten but imperishable yesterday, should bind him more and more firmly in the fetters of their benumbing and degrading sway. With the aid of religion, of reason, and of courtesy, these innate tendencies may be controlled and subverted by volition; and, according to the extent and the direction in which this power is exerted or left dormant, we see human nature in its various phases of brutality or cultivation: on the one hand, scarcely distinguishable from the beasts that perish; on the other, suggestive, in its beauty and sublimity, of higher, and, as yet, unknown endowments.

The next point of difference, between the operations of volitional and of instinctive force, is that the former require a distinct knowledge or idea of purpose, and then more or less practice, for their accomplishment: while the latter require neither; being often performed

unconsciously, and always perfectly. This difference may be clearly exemplified by a comparison between the volitional, and the instinctive, movements of the face. The former, commonly called grimaces, are executed in the same way as any other intentional bodily movements; the power of executing them increases by practice, just as does the power of performing gymnastic feats; and, like all other movements, if very frequently repeated, they become habitual, and may take place unconsciously. But the instinctive movements, or *expressions*, require unconsciousness of their occurrence for their complete display; and are never so well seen as upon the countenance of a young child, where joy or sorrow, surprise, anger, or fear, produce each their special movements immediately that the passions themselves are felt. No practice can imitate expressions. They can only be produced, at will, by directing the thoughts upon the passion whose appearance it is desired to give; and by endeavouring so to feel, and realise it, that it shall produce its effect upon the face. Hence those actors are the most successful, who can most completely forget their own individuality, and identify themselves with the character they represent; when, in fact, they are no longer *acting*. It would be easy to multiply instances of the perfection of instinctive actions in young animals, and to compare them with the imperfection of such as are acquired; but the fact to be remembered is too obvious to demand more than a single illustration. It will be sufficient to quote Paley's celebrated definition: "Instinct is a propensity, prior to experience, and independent of instruc-

tion :'' and to observe that, in all its manifestations, we see a perfect contrivance applied to its destined purpose ; while, in the exercise of volition, a finite and imperfect being is called upon to compass his ends by the best means that his power can supply, or his ingenuity suggest. Hence the actions prompted by instinct always bring about an uniform result, as in the cell of the bee, or the nest of the bird ; while the actions of human volition are infinitely various, and depend for their character upon the individual who produces them. Lastly, it has been said, that the actions prompted by instinctive force are sometimes perfectly uncontrollable ; and often essential to life or safety : while those proceeding from volition never possess the former character, and seldom the latter. This is but to say that the life and safety of the human animal are placed under the guardianship of natural impulses, by which, in time of need, the resources of his own judgment are liable to be superseded for his good. The illustrative phenomena have often been alluded to in former pages ; and this part of the subject will not require any farther elucidation.

The doctrines of force, in relation to the nervous system, may be summed up in the following propositions :

1. The various modes of physical force,—as heat, light, and electricity,—when acting upon, or passing through, material substances, are liable, under certain conditions, to be transformed into each other. When acting upon, or passing through, *living* structures, they are liable to be transformed into a new mode, denominated *vital* force.

2. The life of the body is dependent, first, upon a supply of force from certain external sources (of which the solar heat and light, the atmospheric electricity, and the chemical affinity of substances used as food, are the chief); and secondly, upon its own inherent property of transforming this supply into *vital* force.

3. This inherent property is possessed by every individual cell, in a degree sufficient to maintain its own existence; and, in a greater degree, by the cells of the nervous system, whose office it is to supply other parts of the body, from time to time, with one of the conditions necessary to increased vital action.

4. The term "vital force" may be restricted to that which each cell transforms for itself; and requires, in order to maintain its own integrity, and to resist solution and decay.

5. The term "nervous force" may be used to denote that which is transformed by special cells, over and above their individual requirements, for use in other parts of the frame.

6. Nervous force is recognized under two forms,—the instinctive, and the volitional.

Instinctive force is not subject to the control of the animal, and provides for the proper performance of actions predetermined by Divine Providence.

Volitional force is peculiar to mankind, in whom, to a certain extent, it supersedes the instinctive. It is under the control of the individual in whose nervous system it is developed; and it provides for the performance of actions for which that individual is alone responsible.

CHAPTER III.

THE NATURE AND EFFECTS OF EMOTION.

IF a person of liberal education were asked to define the meaning of the word "emotion," he would, probably, reply, that it includes a great number of different mental states, associated together by the existence of strong feeling, as an element common to them all. Beyond the limits of this explanation, he would scarcely be prepared to answer; and, if pressed with regard to the nature of strong feeling, or called upon for a more minute analysis of the emotional state, it would be found, in the generality of cases, that his ideas on the subject were very far removed from clearness or exactitude. Notwithstanding this, he would readily arrange the emotions in two great classes,—as the exciting, and the depressing, respectively; and he would assign to some of them an acutely painful, and to others, a highly pleasurable, character. He would, moreover, recognize, as the consequences of emotions, many important changes in the physical and mental condition of all persons submitted to their sway; and would have a practical belief (finding expression in action, if not in words,)

that they are competent to diminish for a time the volitional power of those displaying them ; and hence, to diminish also their moral and social responsibilities ; furnishing them with an excuse, more or less valid, for hasty words uttered, or intemperate actions done.

And if regard be paid to the phraseology which is daily on our lips, on all matters connected with excited feeling, it alone will show that the belief referred to is both deeply rooted and widely spread, so as to have left its traces on the very framework of our language. We say, "impelled by emotion," "struggling with emotion," "overpowered by emotion;" and, in using these words, we express our own conviction, and record the conviction of our forefathers, to the effect that emotion is a force, a something which the human will cannot resist without an effort ; and against which that effort may frequently be unsuccessful.

Pursuing the inquiry still farther, and advancing beyond the vague ideas which are embodied in our forms of speech, we obtain more precise information from the writings of Dr. Carpenter, by whom the subject before us has been most carefully studied in all its bearings. He teaches that, "just as the simple feelings of pleasure or pain are associated with particular sensations, the same feelings connect themselves with particular *ideas* ; and thus are produced those *emotional* states of mind which, directly or indirectly, determine a great part of our habits of thought, and are largely concerned in the government of our conduct. The formation of a true *desire*, even for the gratification of some bodily appetite, requires that an idea of the object of desire shall have been

formed; and it is the expectation of the pleasure which will arise from the performance of the act in question, or of the pain which will be produced by abstinence from it, which makes the idea a *motive* to action. * * * * And, in fact, the association of *sensorial pleasure* with *any idea*, or *class of ideas*, gives to it an emotional character.”¹

Dr. Carpenter would, therefore, define an emotion to be an *idea* connected with a *feeling* of pleasure or pain; and this account, although not universally accepted (the emotional state being by some considered to be simple, rather than thus resolvable into two elements), will furnish so complete a key to the comprehension of the facts next to be examined, that I shall avoid a discussion little suited to the elementary character of these pages, and shall accept Dr. Carpenter’s definition in its fullest sense: with the remark that,—as an analysis of the emotional state would explain only the source of its power, without throwing the smallest light upon the causes of the state itself, or upon the manner in which its power is exercised,—the question of its simple or duplex nature, however important a problem in mental philosophy, may be dismissed as irrelevant to a treatise such as this; and as having little or no bearing upon matters of practical utility.

The most remarkable point in Dr. Carpenter’s definition is, that it supposes the occurrence of a change in the brain, contemporaneously with one in the sensorium; and that it thus indicates two sources for the

¹ ‘Principles of Human Physiology,’ 4th edition, pp. 784, 785.

simultaneous development of instinctive force ; leading on immediately to the supposition, that this force would exert itself with greater energy than if it entirely originated in either of the single changes which combine for its production. Hence, we are prepared to recognize the essential *activity* of emotion, and to expect from it, whenever it is aroused, some of the ordinary consequences of the discharge of force upon the system ; an expectation that is fulfilled, both in man and in the lower animals, to a degree which few persons would be likely to anticipate ; and in a form and manner that will furnish the subject of the present chapter.

In order to a clear comprehension of the effects of emotion, it is necessary to refer back to the enumeration already given of the various offices of the nervous system, comprising, as they do, the performance of sensation, motion, and thought ; and the controlling and harmonizing of the nutritive, the circulatory, and the secreting functions. The fulfilment of each of these offices affords a possible channel for the discharge of nervous force ; and, as we have seen that the active development of such force is a necessary consequence of the emotional state, we may arrive by reasoning at a conclusion which experience will most thoroughly confirm ; namely, that an emotion can never remain a subject of mere consciousness ; but that it must always produce a certain evident action upon the system ; either by modifying or causing sensations ; by producing or arresting movement ; by controlling the succession of ideas ; or by altering, in some way, the processes by which secretions are elaborated, by

which the distribution of the blood is regulated, and by which the structures of the frame are built up. It is easy to cite familiar examples of all these modes of its operation: the frequent relief of toothache when the sight of a dentist brings the fear of his proceedings prominently before the mind; the trembling of fear, and the rapid gestures of anger; the constant attraction of the thoughts to a beloved object; the dryness of the mouth dependent upon bashfulness or anxiety; the increased formation of saliva at the sight or odour of savoury and agreeable food; or the increased formation of tears under the influence of sorrow; the blush of modesty or of anger, the sudden pallor of apprehension; and the emaciation so often consequent upon grief or care, are among the first that suggest themselves for the purpose. To classify these effects, and to reduce them to some convenient form for study, must be our first object in dealing with them; and this may be accomplished in some degree by the following simple arrangement into three divisions, which, although they will be found to fade gradually into each other at their respective boundaries, are sufficiently distinct in their marked examples. They are—

1. Preservative actions: instinctively addressed to meet the occurrence by which the emotional state has been excited.

2. Expressive actions: apparently objectless in themselves, except as permitting the harmless discharge of force through a natural outlet.

3. Morbid actions: which not only fulfil no useful purpose; but are absolutely injurious, either to the

system generally, or else to the organ through which they are displayed.

The preservative actions which result from emotion, and which may be supposed most thoroughly to fulfil the purposes for which it is aroused, are more often witnessed in the lower animals than in man; and frequently afford to the former their principal defence against enemies. They are almost confined to the muscular and the secreting systems, and are best illustrated by the ordinary consequences of terror. This passion is followed, in a great number of instances, by hasty flight from the scene of real or imagined danger; a proceeding which, in the human race, even if maintained by the will, is nearly always commenced by instinct; and that, sometimes, in a position where reason would at once point out a better line of conduct. Thus, panic-stricken soldiers throw down their arms and run, without regard to the absence of any accessible shelter, or to the safety given by a bold front and weapons of defence. They follow an irresistible impulse designed by Nature for their protection; but which really leads them into fresh danger, because, from the limited scope of its promptings, a human enemy is able to foresee its operation, and to turn this to his own benefit. Occasionally, terror manifests itself in actions intended to facilitate flight, by the removal of whatever would impede it: a kind of operation in which volition can have no share. It is well known to sportsmen that, on hearing the cry of hounds, a gorged fox will immediately vomit its meal; the emotional force acting upon the muscles of the stomach, before commencing to influence the general locomotive

system. The ordinary effect of fear upon the secretions is to impart to them an unusually offensive character. This change, which may be observed to a slight degree in dogs and other household animals, reaches its greatest intensity in the polecat tribe; some individuals of which, when assailed, emit a stench so unbearable that scarcely any other animal will approach them; and under cover of which they may retreat in perfect safety.

Among the effects produced by more agreeable emotions, but which admit of being placed in the same general category with the above, the increased formation of saliva at the idea of agreeable food is deserving of especial notice, as an evident preparation for that first step of the digestive process—effectual mastication.

The illustrations of the second division, or the *Expressive Actions* produced by emotional states, must be taken chiefly from phenomena exhibited by the human race; and will include blushing and pallor; instinctive play of feature; and the secretion of tears. All these may be seen in perfection during infancy and childhood; and, by carefully observing them, much light may be thrown upon many analogous conditions, and upon the exact nature of the influence that is concerned in producing them. The chief results of such observation, as at present ascertained, may be stated in the following manner:

1. *Looking upon the face of infancy as a blank, we see the effect of habit in tracing the lines of character.* The expression, that is, the particular muscular movement of the face, which is most frequently excited

during childhood, will be more readily assumed than any other ; and not only so, but the muscles which form it will be more actively nourished than those which remain comparatively passive, and will, therefore, be thrown to a certain extent into relief. Hence it follows, that the traces of the most habitual emotion are always visible upon the face ; and that these will be intensified into decided expression under a slighter degree of feeling than would be required for an expression of a different kind. The healthy and joyous infant has always a smile lurking round its mouth, ready to be called forth by any or every object that it sees ; while the fretful child is equally ready to cry. For a certain time, these are but characters traced upon sand, and liable to be speedily effaced or changed by the waves of circumstance ; but they point to the method in which permanent expression is given to the face of the adult ; and explain why the countenance becomes almost incapable of assuming an aspect that is totally at variance with the habitual state of feeling. These considerations give to the science of physiognomy such foundation as it possesses ; and afford certain positive signs, which, when present, can seldom mislead.

2. *Emotion works more energetic effects upon women than upon men, upon children than upon adults, and upon those weakened by illness, than upon the same individuals when in health : thereby showing that the force developed produces actions opposed to the natural or quiescent state of the system ; and that it is resisted in a degree exactly commensurate with the general bodily and mental vigour.* The greater activity of

the emotional state in women and children has been commonly ascribed to greater actual intensity of feeling; but I am disposed to consider this a mistaken view; for the reason that weeping and other external demonstrations, often occur in men or boys who have been much depressed by long or enfeebling illness; and with whom there is no reason to believe that their feelings are more vivid than in health; while there is absolute certainty that their weakened frames must have lost in the power of resistance. Whatever be the explanation, the fact is unquestionable; and it will, moreover, be found, that the weakest part of the system will usually be the outlet for emotional force: so that in persons of great strength and vigour, whose bodily organs defy its influence, it often completely governs the succession of their ideas, and guides their course of conduct. Thus, we commonly see colossal proportions in combination with infirmity of purpose and facility of disposition; while in persons of feeble conformation, the emotions are more likely to find a channel through the body; and to leave volition in undisturbed possession of the mental faculties.

3. *Very strong emotion, especially the passion of grief, appears to exert a paralysing influence over both body and mind; preventing for a time its own discharge, either by tears or through any other outlet. Until this discharge is effected, the health sustains much injury; and under emotions slighter in degree, the discharge of force, either by tears or muscular action, is felt as a necessity, and is found to afford sensible and immediate relief. Hence may be inferred,*

that the retention of emotional force is highly injurious ; and that its speedy expenditure in action is essential to the welfare of the system. The isolated facts, by which the above proposition is supported, are exceedingly familiar, however little their true bearings and relations may commonly be understood. Every one knows, by experience or observation, the relief of tears ; every one who has ever been angry knows the relief,—the absolute diminution in the intensity of the feeling,—which follows from a hasty word or an energetic action. Conversely, every one knows the discomfort that is experienced when such a word or action is prevented by powerful self-restraint ; and, moreover, the effort that is often necessary for this purpose. The injurious effects of retained emotional force are not so self-evident, inasmuch as a feeling requires to be very strongly roused, and its manifestations very forcibly repressed, in order to make these effects immediately visible. They will, however, be considered, and their characters pointed out, under the third general division of the subject.

4. *Considering, firstly ; that, in all but the highest order of brutes, the actions produced by emotion are instinctive, preservative, and uncontrollable, affording a ready and complete outlet for the force aroused : secondly ; that, in the human race (whose conduct, even under circumstances productive of emotion, should always be guided by volition and intelligence,—powers requiring time and deliberation for their proper exercise), a group of harmless and merely expressive actions comes fully into view, after being slightly indicated in the most sagacious of the lower animals : and thirdly ;*

that the retention of emotional force is known to be injurious under any circumstances : the conclusion may fairly be reached, that the use and object of the simply expressive actions is to furnish a safety valve, and to allow the partial discharge or escape of force, during the time required by the human judgment for deciding upon a suitable plan of operation. The statement that expressive actions are almost confined to the human race, will, perhaps, occasion surprise to those who have been accustomed cursorily to observe the actions of the domestic animals ; and to trace in them the undoubted evidences of motives and feelings. But it will be seen, on reflection, that even in the dog (to select as an example the most intelligent and the most demonstrative of the brute creation), there are no actions corresponding to the facial expressions of man ; excepting, perhaps, the movements of the tail. The face of the dog varies much in its appearance at different times ; and we may easily connect these variations with the ideas and circumstances which respectively produce them. We must not, however, forget, that in nearly every case they fulfil a purpose which those circumstances render necessary,—either increasing the power of the ear by altering its position, or adapting the focus of the eye to some particular object, or holding the jaws in readiness as organs of capture or defence. They are, therefore, expressive actions, inasmuch as they tell their tale to the judgment or experience of man ; but they are not, properly speaking, expressions, in themselves. The movements of the tail, however, would seem to be inseparably connected with certain feelings, and to have no other

object than their display ; in these respects resembling the instinctive gestures of humanity. Such movements are very marked throughout the whole tribe of dogs, and are exhibited, to a less degree, in the cat and its various congeners ; but, as a general rule, purely expressive actions are not performed by other members of the animal kingdom ; although they may occur in isolated instances, and especially under the influence of gratification.

The third class of consequences produced by emotion have been described as morbid actions, fulfilling no useful purpose ; and absolutely injurious, either to the system generally, or else to the organ through which they are displayed.

These morbid actions are observed under two totally different aspects. In the first class of cases, the emotional force is not discharged at all ; and, in the second, it is discharged in an injurious manner.

The instances in which no discharge of emotional force takes place occur, chiefly, when some passion is suddenly, unexpectedly, and violently aroused ; and the kind of effect produced varies in some degree with the nature of the feeling, and with its intensity ; although always to be described as a powerful mental shock, by which the vitality and healthy activity of all parts of the body are so much depressed as to render the proper organs incapable of expressing or acting upon the emotional impulse,—an excessive stimulus being followed by an unnatural torpor. This torpor, unless speedily relieved, would occasion death ; the presence of the pent-up force seeming to be incompatible with any long continuance of vital action. In this way are

to be explained those sudden deaths from excessive fear, joy, anger, or other passions, which, although actually very rare, yet happen sufficiently often to be credible when they do occur; and to furnish writers of fiction with a convenient and possible means of dismissing a troublesome character from the third volume. There is much reason to believe that some of the deaths which have taken place, during the last few years, at the commencement of surgical operations, and which have been ascribed to the abuse of chloroform, have really been due to terror: excited either by the prospect of the operation itself; or by the unusual sensations attendant upon the first part of the inhaling process. In illustration of the consequences of repressed grief, a remarkable instance is related by Dr. Carpenter, of two sisters, orphans, "who were strongly attached to each other, and of whom one became the subject of consumption. She was most tenderly nursed by her sister during a long illness; but on her death, the other, instead of giving way to grief in the manner that might have been anticipated, appeared perfectly unmoved, and acted almost as if nothing had happened. About a fortnight after her sister's death, however, she was found dead in her bed. Yet neither had there been any symptoms during life, nor was there any post mortem appearance, which in the least degree accounted for this event; of which no explanation seems admissible, except the depressing influence of her pent-up grief upon her frame generally, through the nervous system."¹ Cases similar to this, and

¹ 'Principles of Human Physiology,' 4th edition, p. 790, note.

perfectly well authenticated, might easily be brought together in no small number; but the principle involved in them is so familiar, and they throw so little light upon the mode of operation by which the fatal result is brought about, that their multiplication would not be attended with advantage. They teach, however, the necessity of endeavouring to obtain external demonstrations in all instances where strong feeling is believed to be excited; a purpose which may be fulfilled, most frequently, as is generally known, by the judicious employment of objects with which the causes of emotion are vividly associated. Thus, the first tears of a widow will often be called forth by the sight of her children, or by the portrait of her lost husband; and when once they begin to flow, she will have escaped all risk of the evil consequences which have now been under consideration.

Very frequently, however, it happens, when the emotional force has for a time been pent up and restrained within the system, either by its own paralyzing effect upon the organs of discharge, or by the volitional repressive effort of the person concerned, that at last it shows itself, or is thrown off, through some unusual and often hurtful channel. Its operations are still essentially the same in kind, but they differ in direction and degree, and correspondingly in their ultimate results. Thus, muscular movement, instead of being limited to the face, may be extended to a limb, or to the entire body, passing on sometimes into absolute convulsions, which exhaust the strength of the sufferer by their violence, while they alarm the bystanders by their unusual character and unexpected

occurrence. Alterations of secretion, instead of affording relief by the harmless burst of tears, may affect organs whose functions cannot long be suspended without danger to life ; and cannot be disturbed without more or less consecutive derangement of the health. The liver, the kidneys, and other important glands, may suffer in this way ; and the foundation of serious diseases may sometimes be traced to their disordered action. Other glands, communicating with the intestinal tube, but smaller, and of less individual importance than those above mentioned, may be affected similarly to them ; and their altered products may excite diarrhœa ; or may cause some of the various forms of indigestion. And it is a curious circumstance that the irregularly directed force of emotion, when acting upon the secreting system, will occasionally paralyse, and completely check, the action of some single gland ; thus doing for a part only of the body what we have seen it do for the whole. It is not long since a case came under my notice in which grief for the loss of a relative was followed in a few hours by intense jaundice (*i.e.*, partial or complete suppression of the secretion of the liver), and a like influence, only slighter in degree, may often be observed. Changes in the circulation, having their types in ordinary blushing or pallor, may go so far as to occasion formidable determination of blood to the head ; or its no less formidable accumulation upon the heart and other internal structures. And, when an emotion is constant and abiding, and for some reason is studiously concealed, its morbid effects are commonly shown in the disturbance of that general harmony and co-adap-

tation between different parts of the frame, which it is one of the most important offices of the nervous system to establish and maintain. Hence, everything will be done a little wrong ; the various members will be out of time and tune with each other ; the imperfect digestion will supply badly-formed blood to them all ; and the healthy nutrition of the body will be checked or perverted. In the former case, simple wasting may be the worst result ; in the latter (the most common), diseased formations may supply the place of healthy structure ; the lungs may become charged with the deposit which is the cause of consumption ; and thus the axe may be laid to the root of the tree of life. Such a train of occurrences as this, is seen most frequently in young women, whose hopes have been centered upon an unrequited attachment, and whose pride or delicacy has made them strive to conceal their feelings from the persons in whose society they have been thrown. The instances are more common, perhaps, than the world in general would suppose ; but still, unless fed by constant external suggestion, a persistent emotion is a rarity ; and, moreover, it implies a vigour and concentrativeness of character that will frequently furnish the best remedy against its injurious effects. Generally speaking, new scenes and new circumstances speedily chase away the memory of the past ; time comes with his healing hand ; and the mind, which has recovered from the storm of passion, will gain, in sobriety, more than it has lost in freshness.

The brain itself, under some circumstances, furnishes the channel of discharge to emotions whose

first impulses have been checked; and the consequences produced, although harmless, physically speaking, must be reckoned as morbid, either in a moral point of view, or when contrasted with their proper standard, the healthy operations of the same mind in which they are displayed.

The ordinary effect of emotion upon the brain is to cause a predominance, of greater or less duration, of the instinctive action over the volitional; so that the feeling excited regulates the train of thought, calls up ideas kindred to itself in quick succession, and defies the will to fix the mind steadily upon other subjects of contemplation. The man whose anger has been roused, or whose pride has been wounded, cannot refrain, for a certain period, from thinking about the cause of offence; and even if he endeavour to divert his mind from it, it will, nevertheless, recur at every unguarded moment, and return to him if guided by the faintest thread of association. And when, the ordinary manifestations of emotion being repressed, the force finds sufficient outlet in thus governing the succession of ideas, the feeling, which was in its first nature transient, becomes a habit of thought; and is said to be *cherished* by the person under its sway. When this is the case, the cherished feeling will, in time, usurp complete control over the actions; and thus, if the emotion be a vicious one, the smouldering embers of malice or revenge will require nothing but opportunity to fan them into flame.

The circumstances, or conditions, that determine which of the various possible effects of emotion shall be produced in any given case, will furnish much in-

teresting matter for observation and study. They are too numerous and too complicated to admit of full discussion within the limits of these pages ; but still a few general principles may be laid down, in elucidation of their nature and mode of operation.

Referring back to the account, given in the first chapter, of the automatic or instinctive actions produced by changes either in the sensorium or in the brain, that is to say, either by feelings or by ideas, it is easy to conceive that the occurrence of a change in both of these organs at once, or the formation of a sensation and an idea simultaneously, would be followed by more energetic action than either of them, singly, could excite. Therefore, in the lower animals, the purpose of emotion seems to be, mainly, to hasten and promote instinctive action under circumstances where it is urgently required. Passing on to man, there is still, when an emotion is roused, a potent incentive to some kind of bodily activity ; but, as the powers of reason and volition, rather than the faculty of instinct, should be employed in rendering this activity appropriate to the occasion, the natural state of things would appear to be, that the emotional force should excite a condition of general activity or mobility in all the organs possibly concerned ; so that they may be in perfect readiness to obey the will, whenever its mandate issues. And, as the process of deliberation occupies a certain time, and as its final result may be to determine upon quiescence, as more prudent or proper than action ; so, during its continuance, the expressions of the face furnish a safety-valve to provide against the injurious retention of emotional force ; and, at its

close, the secretion of tears, together with certain gestures and movements, furnish channels through which, in case of need, the whole of the force may be harmlessly discharged. In this way, the reasoning being has all the advantages of an instinctive readiness for action; and has, also, the power of choosing whether to act or not. If he does not act—either in accordance with the dictates of his feelings, or in some other manner; so as voluntarily to exert the nervous force that is aroused—nature liberates this force for him, and liberates it in the least injurious way. For in such case, the effect is usually divided among several organs, in proportion to the original strength of the emotion; so that blushing, weeping, gesture, and sobbing, may occur together; and thus the power of the explosion may be weakened by its diffused operation. But, inasmuch as these spontaneous actions prove clearly, to all who see them, the existence of strong passion in the individual by whom they are displayed, they become confessions of weakness, which most persons will endeavour to avoid. In the attainment of this object, the power of will may again most effectually be exerted; it being found that active and sustained volitional exertion of any kind, either bodily or mental, will furnish the necessary outlet, and will completely use up, and exhaust, any amount of nervous force that an emotion may have aroused. But it frequently happens that persons ignorant of this fact, or perhaps wanting the energy required in order to avail themselves of it, will endeavour, when under the influence of strong feeling, to exert upon themselves a simply repressive action; and to keep down any external

manifestations that would be confessions of weakness ; but without substituting for them another kind of activity. Then it is that the imprisoned force is compelled to seek an unnatural outlet. If it be considerable in amount, some single organ, or set of organs, is commonly made the channel of its discharge ; if it be slight, the general harmony and well-being of all the parts immediately dependent upon the nervous system are apt to be deranged. In the former case it is almost self-evident that there must be some conditions by which the selection is influenced or guided ; and of these the most important are, attention, and morbid excitability : the first serving as a guide in the direction of the force ; the second giving, to the parts affected, an increased liability to suffer from its operations.

The description of the effects of attention in guiding an emotional impulse may with propriety be postponed until the other consequences of that mental state come under discussion ; and at present, therefore, morbid excitability will alone be taken into account.

Under this general term, then, it is intended to include all those conditions, whether natural or acquired, whether healthful or diseased, by which any organ or part of the body may be rendered, through some change in its own state, unusually liable to become the outlet of an emotion. Of these, the most important, as regards individual muscles, is habit, especially when so confirmed as to have merged into a secondary instinct ; and, as regards individual glands, a state of exalted functional activity. There are, how-

ever, certain unhealthy and depraved states of the blood, which seem to increase the excitability of the whole body; and some of which produce unnatural irritability of the whole muscular,—others of the whole glandular, system. In the former case, probably, the muscles are weak from imperfect nutrition; and in the latter, the glands are already overtasked for the removal of impurities. Local diseases, involving local weakness, often originate, in the parts which they affect, an excessive proneness to suffer from emotion; and this proneness may remain long after every other trace of unhealthy action has disappeared; while, lastly, certain individuals exhibit inherent peculiarities of constitution, which render them liable to be influenced in an exceptional manner.

The effect of habit upon individual muscles, is illustrated, not only by those persons who frequently practise some gesture or trick; but also by those whose daily occupation requires a movement that is easily recognizable. In the former case, especially, it cannot escape the notice of the most superficial observer; inasmuch as every one who is accustomed to perform any of those little tricks, from which few persons are altogether free, may be seen to exaggerate it, from time to time, under the influence of the slightest emotional excitement. Novelists “hold the mirror up to nature,” by the use they make of this familiar fact; commonly investing such of their characters as are intended to approach the grotesque with some quaint mannerism, that may be intensified whenever the events of the tale permit. Assiduous pianoforte players are exceedingly given to the gymnastic per-

formance known as the devil's tattoo; and the fingers of practised knitters work in double time if they are embarrassed or annoyed. Similar examples may be taken from many other habits and avocations; and the reader, doubtless, will easily recollect many for himself.

A gland in a state of activity furnishes a very usual outlet for the morbid discharge of emotional force; and the consequence may be either the increase, the suppression, or the alteration of its secretion, although the first of these effects is most familiar as one of the expressive actions;—for instance, in the shedding of tears, the watering of the mouth, and a few similar occurrences. The suppression of secretion may often be observed in the mouth, which speedily becomes dry under the influence of fear or anxiety;¹ and the same change obtains, to a considerable degree, in many of the glands whose products are subservient to the digestive process; and whose torpor may occasion much internal discomfort and derangement.

An alteration in the character of a secretion is an event that probably takes place very often, even under the influence of slight and trivial causes; but there is one period during which we have the means of veri-

¹ Dr. Carpenter mentions that it is an Indian custom to detect a thief among the servants of a household, by causing them all to chew uncooked rice, the offender being distinguished by the comparative dryness of his mouthful. The author, not long since, was present during an attempt made to address an audience by a gentleman, whose extreme nervousness dried his mouth so completely that he could not articulate, and who was compelled to abandon all endeavours at oratorical display.

fyng its occurrence, and of observing closely its effects. This is the period of suckling, when the milk-glands are rendered particularly liable to be affected, not only from the increased excitability dependent upon the contrast between their temporary activity and their usual repose; but also from being placed, in an especial manner, under the influence of the feelings, in order that the maternal solicitude and affection may promote the necessary flow of their secretion; and when, at the same time, the delicate stomach of the infant instantly detects an injurious change in the quality of its food. With mothers of a highly emotional or "nervous" temperament, these circumstances exert a marked influence upon the health of their unfortunate offspring; the baffled whims, the capricious tempers, or the petty jealousies, that are forgotten by the parent in an hour, often entailing indigestion, and pain, and restlessness, upon the child. When passions of a more intense, or more abiding, character are aroused, their effects will be still more grave; and several cases are recorded, in which the death of young infants has been immediately consequent either upon violent anger, or upon extreme anxiety and depression, on the part of their nursing mothers, whose milk has been converted into an energetic poison. These instances, as well as many of the slighter forms of infantile sickness, should carry with them a most serious warning; and should not only teach to mothers the necessity of watching carefully over their own temper and spirits; and the duty of striving for the contentment and placidity which will protect themselves and their children from such self-

wrought evils; but should impress, also, upon those with whom the mother's lot is cast, that it is their part to shield her, with all solicitude and tenderness, from every avoidable cause of resentment or of care. And whenever these causes are unavoidable, or whenever an ill-disciplined mind frames them for itself from the casualties of life, then the attempt to nurse an infant should be at once abandoned; inasmuch as its present safety will be perilled, and its future health certainly impaired, by improper or inadequate nourishment during the first few months of its existence.

The unhealthy states of the blood which modify or direct the effects of emotion, are of two principal kinds: the first being due to the formation of a special impurity, which constitutes the essence of some particular disease, and involves a liability to its attacks; and the second to the retention of ordinary impurities, either through the incomplete working of the glands by which they should have been removed, or through their production in excessive quantity. Rheumatism and gout may be taken in illustration of the former class; and the bilious temperament in illustration of the latter. The first two maladies are believed to depend upon the formation of certain matters in the blood, which, when present in sufficient quantity, or under particular conditions, produce those symptoms by which they are commonly recognized. But it is found, when the tendency to rheumatism or to gout, although sufficiently evident, is not fully and perfectly developed, that there is a great liability to spasmodic or convulsive diseases, displayed through the muscular system, and commonly excited in the first instance by

emotion. Chorea, asthma, and hysterical affections, may be of this nature; and they are much more frequent in families having a gouty or rheumatic taint than in those where this taint cannot be discovered. The bilious temperament, however, exerts a very different kind of operation. Its cause may be concisely described, by saying that the liver does not perfectly accomplish its daily task; and that a noxious accumulation takes place in the blood, commonly manifesting itself periodically in attacks of headache and sickness. And, although the liver is the organ primarily at fault, the action of other excreting glands is more or less hindered by their endeavour to aid it in the performance of its office, so that they all, probably, are somewhat in arrear. When this is the case, any strong emotion will instantly bring their embarrassment to a climax; and will produce the "bilious attack" that might otherwise have been postponed for many days.

It still remains to speak of the influence of local diseases in attracting emotional force to the structures that have been affected by them; but this part of the subject may, almost, be dismissed with the statement that strong feeling is an adequate and not infrequent cause of relapse, after nearly every kind of illness. In the weaker and more emotional sex, however, there is, in the period immediately subsequent to childbirth, a condition of things nearly allied to local disease; in which a similar influence is often very strongly manifested, and concerning which, even in these pages, a word of warning may not be altogether misplaced. At this period, tranquillity of mind is

perhaps more important than at any other; and comparatively slight emotion will often excite dangerous disease:¹ a result at which we must cease to wonder, when the combination of bodily weakness and mental excitement is fairly taken into account.

Before concluding this imperfect sketch of the nature and effects of the emotional states, it will be proper to advert to the means by which they may be overruled or counteracted,—means which may be considered under two principal heads, comprising, first, the agencies which check their development; and secondly, those that interfere with the production of their effects. And, if the emotions be collectively considered, the only power capable of accomplishing the former object will be derived either from profound religious convictions; or from that constant exercise of judgment, which distinguishes the frame of mind called “philosophical.” Taken singly, each emotion may be kept at rest by some habitual feeling or belief of a kind opposed to it,—as, for instance, shame, by vanity and self-esteem; grief for others, by selfishness; anxiety, by the doctrines of fatalism. In this way the stoicism of Indians and Mahometans is probably to be accounted for. But these habitual feelings may almost be looked upon as perpetual emotions

¹ Some time ago, the author had occasion to examine minutely the records of the Royal Maternity Charity, which had been carefully kept for many years by Dr. Ramsbotham; and which embraced upwards of sixty thousand cases. They contained, of course, many instances of serious illness commencing within a few days after confinement; and, in nearly all of these, either fright or passion was assigned as the exciting cause.

already in possession; and they have no protecting action, save against their opposites. Thus, vanity would do nothing towards repressing anger, but would rather increase the liability to it; and the same holds good of all analogous states. Every emotion, however, can be overcome by those who have thoroughly learned the lessons of reason, or of Christianity: the former displaying the folly, as the latter the wickedness, of the great majority of human passions: the one leading us to smile at the vociferous impotence of anger, and to strive against the degrading weakness of fear; the other showing that our grief is often but idle repining at the will of the Almighty, and our anxiety, a criminal distrust of His undiscovered mercies. When either kind of knowledge is fully realised by the mind, the occurrences which ordinarily excite emotion have their effects limited to the suggestion of trains of thought; they furnish the philosopher with matters for reflection, and they minister to the faith or the hopefulness of the devout. Results so astounding to the natural man are attained, in the two cases, by processes diametrically opposite. The constantly-exercised power of abstraction, of controlling by volition the succession of ideas, brings in a moment the wisdom of precept and of experience to the assistance of the sage; while the habitual predominance of a governing idea, permits no disturbance of the tranquillity of the devotee. But it is in the combination and balancing of these seemingly antagonistic mental conditions that we seek our ideal of moral and spiritual excellence; properly requiring that enthusiasm should be tempered by

discretion; and that judgment should be animated by zeal. For the control of volition over the mind may be exercised for the vilest, just as for the best, of purposes; and may guide the machinations of a Borgia, as well as the studies of a Newton. And, if the human will be once completely surrendered to the dominion of an idea, the unnatural ruler is apt to run riot with its captive,—leading it into the depths of bigotry, or through the mazes of fanaticism; and always liable to be exhausted by the very violence of its own manifestations. Then, follow the phenomena of mental reaction. The idea first in possession is succeeded by another, commonly of a directly opposite character; and, after the occurrence of a few similar changes, the mind loses its individuality, and, like a mirror, does but passively reflect the appearances of external objects.

When an emotion is actually aroused, but when, as yet, neither its ordinary nor its extraordinary effects upon the system have been produced, these may be prevented, in nearly every instance, by active volitional exertion of any kind. Bodily exertion is to be preferred, inasmuch as it is more easily commenced, and is less liable to interruption; but mental exertion will answer the purpose, for those, at least, who know how to practise it. It would seem that, as there is a necessary limit to the amount of nervous force which an individual can develop in a given time, so it is in the power of the will to make a full demand upon this amount; and to cause its entire expenditure through a given channel; thus selecting an outlet that shall do away with the necessity for others; and shall afford

to the system the relief that is required. Runjeet Singh, the famous "Lion of Mysore," being enraged at the terms of a treaty proposed to him by the British government, sprang upon a horse, and for some time galloped furiously about the plain. When the exercise had sufficiently cooled his blood, he returned to our astonished envoy, and resumed the interrupted negotiation with dignity and calmness. The Rev. Henry Rogers, in his preface to the life of John Howe, bears touching testimony to the value of intellectual labour for the mitigation of the sufferings of grief. But whether the labour be physical or intellectual, those who would profit by it must do it with their might; and must continue it, either until the emotion is felt to have subsided, or until a sense of fatigue demands the repose of sleep.

The explanation above given of the utility of exercise in the control of emotion, is not only in perfect harmony with the general principles of nervous activity, and with the doctrines laid down in the foregoing pages; but is strikingly confirmed by the apathy which results from excessive fatigue. A person who is thoroughly tired will hear either the most gratifying or the most shocking intelligence with composure; as if the nervous centres were exhausted of their force; and required time for recovery before a further quantity could be developed. After sleep, the information that has been received again presents itself to the consciousness; its true import becomes fully appreciated; and the consequent emotions are for the first time aroused. Such a statement as this can, of course, only be made comparatively; because, for every in-

dividual there may be certain moral stimulants which would excite and maintain central activity ; until the cessation of life rendered that activity impossible. But, in a general sense, the facts will be as described ; and will admit of perfect illustration from many of the petty events of life, as well as from its greatest trials and its most appalling dangers. The tired man of business returns to his home at night, and yawns over a tale that would have excited his interest or his anger in the morning. The shipwrecked emigrant, who has been cast on shore after buffeting with the waves, will sleep long and quietly as soon as he arrives at a place of refuge ; and although he may be aware of the loss of his friends, of the destruction of his property, of the failure of his cherished hopes—these are calamities which, at that time, he does not distinctly feel or realise. From evidence of this sort, we may safely conclude that energetic volitional efforts will appropriate emotional force for their fulfilment ; and will ensure the complete absence both of its expressive and of its morbid results. If the emotion be of a transient character, a single effort will commonly suffice for its removal ; but if it be more persistent, it will be necessary, upon the subsidence of fatigue, to return with assiduity to the plan of action that has been laid down.

The futility and danger of directly repressive efforts, exerted in opposition to emotional force, has already received incidental mention ; but the subject is sufficiently important to excuse a brief repetition of what has been advanced. It may be conceded that, even when an emotion is fairly established, its effects are

under the direct control of the will in some degree, and for a certain time ; but as each of the opposing forces is liable to numerous variations of strength, so neither the degree nor the time can be exactly estimated. And, unless the emotion be very slight, its influence will be found to possess a cumulative property ; so that, after being kept down for a longer or shorter period, it will be apt to break forth with greater violence than at first ; and through other and more dangerous channels. Hence it is evident that the will cannot be usefully exerted in a direct attempt to restrain the external manifestations of feeling ; because it is almost certain to be conquered by them at last, leaving the system minus the amount of power that has been expended in a fruitless effort ; and liable to a destructive explosion, because its natural safety-valves have been forbidden to discharge their office.

Throughout the whole of the foregoing chapter, it has been a chief object to impress the mind of the reader with the facts stated at its commencement ; that is to say, with the essential activity of the emotional state ; and with the knowledge that this state is not only an ordinary and energetic cause of direct bodily changes, but also a cause whose effects cannot be repressed, or kept in abeyance. Unless produced in the natural order of things, or in a manner determined by the guiding influence of the will, they will inevitably overpower the system at its weakest point ; and will issue in evils of greater or less moment, but whose duration or extent it is not always possible to foresee.

CHAPTER IV.

THE NATURE AND EFFECTS OF ATTENTION.

Perhaps the best definition that can be given of Attention is, that it consists in the prolonged occupation of the brain by a single idea, or of the sensorium, by a single feeling. The existence of this state, and especially its relation to the faculty of Memory, have long been matters of familiar knowledge; but were scarcely made the subjects of scientific research, until Mr. Dugald Stewart perceived and explained their importance. Since his day, the attentional state has been observed more carefully than before; and has been found to furnish many remarkable facts, and much material for examination, not only to the mental philosopher, but also to the physiologist and the practical physician. The elegant essay of Sir Henry Holland has recently brought many circumstances connected with attention under the notice of the public; and the more profound writings of Dr. Carpenter have impressed these with a stamp significant of their currency and value. The scope of the present chapter will, therefore, be limited to a brief review of facts

that have been already announced ; and to an attempt to place them in their right position with regard to the other operations of the nervous system.

In the writings of Mr. Stewart, already referred to, there are several passages which will serve admirably as an introduction to the first part of the subject ; and these I shall now proceed to transcribe at length.

“ With respect to the nature of the effort without which we have no recollection or memory whatever, it is, perhaps, impossible for us to obtain any satisfaction. We often speak of greater or less degrees of attention ; and, I believe, in these cases, conceive the mind (if I may use the expression) to exert itself with different degrees of energy. I am doubtful, however, if this expression conveys any distinct meaning. For my own part, I am inclined to suppose that it is essential to memory that the perception or the idea that we would wish to remember should remain in the mind for a certain space of time, and should be contemplated by it exclusively of everything else ; and that attention consists partly (perhaps entirely) in the effort of the mind to detain the idea or the perception, and to exclude the other objects that solicit its notice

“ Before we leave the subject of attention, it is proper to take notice of a question which has been stated with respect to it ; whether we have the power of attending to more than one thing at one and the same instant ; or, in other words, whether we can attend at one and the same instant to objects which we can attend to separately ? This question has been already decided by several philosophers in the negative ; and their

opinion appears to me to be the most reasonable and philosophical that we can form on the subject.

“There is, indeed, a great variety of cases in which the mind apparently exerts different acts of attention at once; but from the instances which have already been mentioned, of the astonishing rapidity of thought, it is obvious that all this may be explained without supposing these acts to be co-existent; and I may even venture to add, it may all be explained in the most satisfactory manner, without ascribing to our intellectual operations a greater degree of rapidity than that with which we know from the fact that they are sometimes carried on. The effect of practice in increasing this capacity of apparently attending to different things at once, renders this explanation of the phenomenon in question more probable than any other.

“I endeavoured, in a former chapter, to show that there is a certain act of the mind (distinguished, both by philosophers and the vulgar, by the name of attention), without which even the objects of our perceptions make no impression on the memory. It is also matter of common remark, that the permanence of the impression which anything leaves on the memory, is proportioned to the degree of attention which was originally given to it. The observation has been so often repeated, and is so manifestly true, that it is unnecessary to offer any illustration of it.”

“I have only to observe farther, with respect to attention considered in the relation in which it stands to memory, that although it be a voluntary act, it requires experience to have it always under command.

In the case of objects to which we have been taught to attend at an early period of life, or which are calculated to rouse the curiosity, or to affect any of our passions, the attention fixes itself upon them as it were spontaneously, and without any effort on our part of which we are conscious. How perfectly do we remember, and even retain, for a long course of years, the faces and the handwritings of our acquaintances, although we never took any particular pains to fix them in the memory? On the other hand, if an object does not interest some principle of our nature, we may examine it again and again, with a wish to treasure up the knowledge of it in the mind, without our being able to command that degree of attention which may lead us to recognize it the next time we see it. A person, for example, who has not been accustomed to attend particularly to horses or to cattle, may study for a considerable time the appearance of a horse or of a bullock, without being able, a few days afterwards, to pronounce on his identity; while a horsedealer or a grazier recollects many hundreds of that class of animals with which he is conversant, as perfectly as he does the faces of his acquaintances. In order to account for this, I would remark, that although attention be a voluntary act, and although we are always able, when we choose, to make a momentary exertion of it; yet, unless the object to which it is directed be really interesting, in some degree, to the curiosity, the train of our ideas goes on, and we immediately forget our purpose. When we are employed, therefore, in studying such an object, it is not an exclusive and steady attention that we give to it, but we are

losing sight of it, and recurring to it every instant; and the painful efforts of which we are conscious, are not (as we are apt to suppose them to be) efforts of uncommon attention, but unsuccessful attempts to keep the mind steady to its object, and to exclude the extraneous ideas, which are from time to time soliciting its notice.

“If these observations be well founded, they afford an explanation of a fact which has been often remarked, that objects are easily remembered which affect any of the passions. The passion assists the memory, not in consequence of any immediate connexion between them, but as it presents, during the time it continues, a steady and exclusive object to the attention.”

From the foregoing extracts, it is evident that Mr. Stewart regarded the attentional state as being in no way distinct from simple consciousness; and that he did not recognize any differences in its absolute intensity or degree; but only in the time of its uninterrupted duration with reference to any single idea. He was aware that ideas may pass through the mind, and may be evidenced in their results, without becoming the subjects of consciousness at all; and he believed that when an idea did become so, the mind was directed to it exclusively, either for a considerable period of time, or perhaps for a moment only, or even in an interrupted, and, as it were, vibratory manner, the attention rapidly going and returning between two or more objects of notice.

It must, however, be remarked, that there is a palpable contradiction between Mr. Stewart's defini-

tion of attention, as consisting in an effort of the mind to detain an idea or a perception; and the account which he gives, subsequently, of the effect of habit, of the passions, or of an especial interest or curiosity, in rendering certain ideas more easy to detain than others. The contradiction becomes still more apparent in the sequel, where, speaking of wandering attention, the painful efforts of which we are conscious are said to be (not efforts of uncommon attention, but) unsuccessful attempts to keep the mind steady to its object. For it is plain that the word effort presupposes the exercise of volition, without which no effort can be made; so that the definition might be rendered by the phrase *volitional consciousness*. And, when the attention is engaged in following out a connected train of thought, this definition would be just: the will, in such case, selecting certain ideas from many that are suggested, causing them to be dwelt upon during pleasure, and again selecting among those to which they may in turn give rise. But if this volitional effort were in all cases necessary, either to the commencement, or to the maintenance, of the attentional state, so as to be with propriety included in a definition of it, and to furnish an essential condition by which its existence might be tested, then it would be inconceivable that habit, or curiosity, or passion, should render the effort either more easy or more difficult. In bodily action, these circumstances facilitate an exertion of will; but only by bringing the instinctive power into harmonious co-operation with it; and their joint action may be likened to that of a man who pushes with both his

hands, for the more effectual and speedy attainment of some object, which either hand alone would in time have accomplished. The aid of the left hand enables him to overcome the obstacle more speedily ; but it does not add to the actual force exerted by the right ; and it would not be available in a position where only the right could find a *point d'appui* ; or if, from some anatomical peculiarity, the right alone were calculated for the performance of the act desired. In like manner, if effort were the essential requisite for attention, the left hand (that is to say, the instinctive operations of the passions, and the secondary instincts derived from habit,) could not, by any possibility be brought to bear ; and, therefore, the universal experience of mankind will testify, not only that attention cannot be entirely the result of volition, but that it may be excited and maintained in perfect independence of this faculty. Moreover it may be argued, that all effort must involve consciousness of its performance ; and that it is incredible that such consciousness should have no existence when the effort is most thoroughly and completely made ; while it is acutely felt in the interval between one act of attention and the next. But these contradictions were the necessary results of an imperfect physiology ; and it will be shown that they have been satisfactorily cleared away, as the boundaries of this science have been enlarged.

In Mr. Stewart's day, physiologists had not discovered the existence of that vast automatic apparatus, which performs so large a part of the offices of the nervous system ; and want of knowledge on this subject

was a fruitful source of perplexity to mental philosophers. The actions performed through the instrumentality of the spinal cord, or the sensorium, were long confounded with those requiring intelligence or displaying volition ; and hence arose questions concerning the possibility of duplex thinking, and other similar matters, which afforded an ample field for subtlety of argument, and refinement of distinction. In Mr. Stewart's writings, he expressly contends against the hypothesis of automatic action ; which at that time had been advanced only as a probability, although now it is established as a fact. The knowledge that, how completely soever our intellects may be plunged in abstraction, the sensorial and spinal actions will still be perfectly accomplished by means of their respective centres, has greatly simplified the study of metaphysics, and promises speedily to remove the imputation of obscurity under which this branch of science has so justly laboured. In the mean while, Dr. Carpenter has pointed out how this knowledge may be used to explain those different aspects of the attentional state, which Mr. Stewart could not have failed to notice ; but for which he would certainly have been unable to account.

It is presumed, then, on the ground of numerous facts and a most evident analogy, that attention, like muscular movement, may be either volitional or automatic ; depending, in the former case, upon the effort described by Mr. Stewart ; and in the latter, upon an inherent attractiveness in the objects of notice : the will being passive, except in *not withdrawing* the mind from the perception with which it is engaged.

Attention, or active consciousness, may thus be regarded as bearing a relation to the brain, very similar to that which bodily movements bear to the muscular system; and the facts formerly advanced concerning the influence of volition, and of instinct, over them, may be applied, *mutatis mutandis*, to the explanation of the attentional states.

The most complete and profound form of attention with which we are acquainted, has received the name of Abstraction, when produced by the will; and of Reverie, when occurring spontaneously. It may be described by saying, that the occupation of the mind by one subject is continuous and unintermitting; so that the trifling external things which commonly intrude themselves upon the intervals of graver thought, can find no time for entrance, and altogether escape notice. This state of the brain, and the mode in which it differs from the more ordinary forms of attention, may be illustrated by supposing a group of persons, all engaged in watching some distant object, as a ship, or a balloon. It is easy to conceive one individual among the group of spectators, with eyes so rivetted to the object of attention that they might never be turned away from it for an instant; and that their possessor might be in perfect ignorance of the number, appearance, and conduct of the remaining bystanders; who, although observing the same object with himself, would probably look elsewhere from time to time, and would thus become cognizant of the persons and things by which they were surrounded. After the same manner, the great majority of persons, even when engaged in thought, are far from being

continuously engrossed by it; suffering their minds, every now and then, to stray from the subject under consideration, and to dwell for a moment upon something that solicits notice. They leave their intellectual work, and almost instantly return to it; but however brief the interval, the continuity of attention has been broken, and an irrelevant idea has crept in. The interruption thus caused would be complete, even though the intrusive idea were of the most trivial description; as the mind would leave off attending to the former subject of thought, in order, for some short period, to attend exclusively to the new one. In abstraction, or perfect attention, however, the mind does not thus leave off attending to its main object; and consequently it cannot be intruded upon. The ideas that await its notice, and that might for a time occupy its attention, cannot make themselves felt whilst the brain is occupied; it being clear that this organ must cease attending to one thing, before it can commence attending to another. A condition parallel to each of those above described may constantly be observed in purely physical exertion. A person walking for pleasure will often stay his steps; and, without any particular object or choice of place, will pause, and look around him, before proceeding. On the contrary, one who is earnestly desirous to reach a distant place, will not suffer the most attractive scenery to delay him; but pushes on, without stop or intermission, until his object is attained. Whether we regard brain or muscle, in short, the fact would appear to be, that the natural and unforced exercise of either is varied by short periods of comparative repose; in which the body,

although not moved so actively, would by no means be perfectly still; and the mind, although relieved from tension, would employ itself in the careless observation of surrounding objects. But, under especial circumstances, or when there is, from any cause, a demand for unwonted effort, the mental and physical energies of a healthy person should be fully equal to the call thus made upon them; and should be able to accomplish a considerable amount of close and energetic application.

The methods, by which the different forms of Attention may be brought about, are various. If we return to the group watching the distant object, it will be easy to point out how some of these methods exert their influence. A man of science, observing the progress of an experiment, would serve to illustrate the act in its purely volitional form. His mind would be brought to bear upon the subject by the effort of his own will; and (unless under circumstances hereafter to be noticed), his thoughts would wander if this effort were withdrawn. A seaman would attend chiefly to the manœuvres of a ship, because habit and association would invest them with a greater interest than he would be likely to attach to any of the objects on the shore. A landsman, if the ship were in danger, would feel that its claim upon his attention was strengthened by the circumstance; but, if it contained a friend or relative, in whose safety he was deeply interested, the claim would become irresistible, and his attention would (as it is said) be rivetted, not only without any exertion of his will, but in a manner which he would probably be unable to overcome, even

if desirous to divert, temporarily, the current of his thoughts. The second of these examples would be attention of the secondarily automatic character, produced independently of volition, by the effect of habit; and having reference to things possessing no universal or intrinsic interest, apart from the personal predilections of the looker-on. The last form would be purely automatic in its character, requiring no volition, no habit, no learning beyond bare knowledge of the facts; and it would occur with certainty in almost every individual whose natural sympathies had not been blunted or perverted by habits opposed to the instincts of humanity. These three leading divisions of the attentional state are each of sufficient importance to require a separate notice; and the automatic, as being the most simple, will be the first to present itself for consideration.

In automatic attention, says Dr. Carpenter, "the attention is drawn towards an object of consciousness by the attractive qualities of the object itself, and may be held to it until it is intentionally detached, or until the mind has become satisfied by the persistence of one kind of impression." The causes of this state must therefore be sought, not so much in the mind itself, as in the qualities of the object attended to; which will be found, generally, or perhaps universally, to be capable of exciting *emotion* in the persons influenced by it. The ship already imagined, becomes the centre of earnest attention so soon as the apparent danger of the crew excites pity for their condition; and hope for their eventual safety. It becomes a point of irresistible attraction so soon as these feelings

are intensified by personal interest in the fate of some individual on board. The more powerful the emotion, the more completely will the attention be fixed; especially if the circumstances be such as to leave no room for useful exertion; and to compel those on shore to await the course of events which they cannot alter. It may, perhaps, be stated as a general proposition, that every emotion, when not sufficiently violent to paralyse the system by its shock, and when not immediately or entirely expended by the occurrence of muscular or glandular action, must produce automatic attention in some degree: directing the mind involuntarily to the idea of the object by which the emotion has been excited, or at least to some kindred train of thought; and directing it with such pertinacity, as to diminish, in a marked degree, the power of volitional application to other matters. Persons who have been pleased, or astonished, or offended, say and feel that they cannot avoid frequent recurrence to the subject of gratification, or surprise, or annoyance. In spite of endeavours to the contrary, they will often speak of it, and they will be certain to think of it more often still. It would be rash to say that the feelings furnish the only methods by which automatic attention is capable of being aroused; but it is impossible to doubt that they are its chief and most energetic causes. From their almost infinite number and variety, and from the manner in which they combine with, and modify, all the affairs and actions of life, they may be recognized under all the circumstances in which involuntary attention can exist; and, as their power of producing this state is often manifest, and

their coincidence with it universal, they may, for all practical purposes, be looked upon as its ordinary source.

The nature of the effort required for volitional attention has been already described in former chapters, when treating of the power of the will to direct the current of thought. It is probable that the organization of certain individuals is such as to endow them with this power in a remarkable degree; but, at the same time, it is so dependent upon exercise for its very existence, and may be so highly increased by cultivation, that original differences are, for the most part, merged in those that are acquired. Persons engaged in purely intellectual pursuits, and especially in such as do not require the observation of phenomena, or the performance of experiments, find it necessary to exclude, as far as may be possible, all thoughts or impressions of a nature foreign to the subject; and there have been some, whose volitional attention has been of the most perfect kind; so that, at its termination, they would have no knowledge of the events that had taken place under their eyes. Abstraction such as this would be quite beyond the reach of the generality of persons; and may be regarded as the last attainment of the philosophical mind. The effort required for its accomplishment is a very considerable one; and is followed by fatigue and lassitude, such as would be produced by severe physical exertion. This result may be held to demonstrate that the nature of the force employed is the same in either case; and that the difference depends only upon the different channel into which its activity is directed. The con-

sciousness of effort, too, and the increasing difficulty of keeping the mind to its work, are exactly similar to the sensations caused by bodily labour; and the parallel may be farther extended to the increase of power consequent upon each successful endeavour. This increase, as it is experienced in the bodily organs, may be referred to two principal causes; the first being the increased growth and development of the muscles exerted; and the second being the assistance rendered, by the instinctive division of the nervous system, in the performance of any act that has become habitual. Precisely the same causes may be observed to influence the operations of the mind. For there can be no doubt that the nutrition of the nervous centres is most favorably affected by the regular performance of their functions; and that every portion of them derives increased energy from proper and judicious exercise; either the absolute number of the active cells being increased; or their individual power becoming greater; or their reproduction taking place more rapidly. Thus, as in the instance of the muscle, the organ employed gradually becomes equal to greater and more sustained exertion; and, at the same time, important aid is afforded by the spontaneous co-operation of another agency, which accomplishes its object with a less expenditure of vital force. This agency is *habit*; by means of which attention of a secondarily automatic character is blended with or supersedes the volitional; and the operations of the will are by degrees limited, so as to assume a passive or permissive character, when once the desired action has been commenced.

The effect of habit in controlling the spontaneous working of the brain ; and in promoting the recurrence of ideas to which the attention has previously been directed by an effort of the will, is explained by Dr. Carpenter as a result of the laws of association and nutrition. By the former, an abiding connexion is established between any two states of consciousness that have once been linked together in successional order ; so that the presence of the first of them shall recall the second to the mind. By the latter, the parts of the nervous centres which are exercised in a particular pursuit, or train of thought, are reconstructed, as they waste, on a plan especially adapted to the performance of the habitual exertion ; so that the brain, like the body, adapts itself to the claims made upon it, and “grows to” some special manner of activity. The practical result of this gradual change is experienced by almost every individual ; although the change itself, being commonly wrought during the period of youth, may often escape observation. In consequence of its occurrence, mankind are enabled to apply themselves steadily to their various occupations and callings, without suffering the exhaustion that would follow a persistent volitional effort ; and even those whose lives are wasted upon trifles commonly find that custom has rendered the pursuit of one trifle easier than that of another ; and that the various objects to which chance may have induced them to direct attention, are, ever afterwards, possessed of peculiar interest in their eyes.

The general characteristics of the attentional state are found to differ in some degree with its profundity ;

and with the manner in which it has been induced; thus giving rise to various names, by which the differences may be concisely expressed. In describing them, it will be necessary to take as a standard the mental condition of a healthy person, at a time when his perceptive faculties are keenly alive to every intellectual or sensorial change, to every idea floating through his mind, and to every occurrence in the world around him. Departing from this standard, the first noticeable change is denominated "absence of mind." In this condition, the pre-occupation of the brain diminishes its susceptibility to impressions communicated by the sensorium; and renders the person negligent in the performance of those actions which the circumstances around him would seem to require. Thus, friends may be passed by without notice, food may be sent away untasted, and duties proper to the place or the occasion may be altogether omitted; simply because a sensorial impression would require to be stronger than usual, in order to excite an idea at that particular time. It is well known that absence of mind is almost peculiar to certain individuals; and it may be added that those who cultivate volitional attention are scarcely liable to it. As a rule, they would possess the power of determining when to attend; and their minds would not be led captive at unseasonable times or in improper places. Some highly-gifted persons have been remarkable exceptions to this statement; and it may be presumed that, in these instances, the occupation of the thoughts by subjects of study or research has been almost continuous; and has afforded no opportunity for attention

to the common events of life. Generally speaking, absence of mind is a proof of intellectual vacuity rather than of exertion; and is the appropriate result of idle and visionary musings. When exhibited by a philosopher, it must be regretted as a defect in his mental organization; and it may often be traced, among the vulgar, to a contemptible affectation of singularity.

Proceeding to the consideration of the more profound degrees of attention, the next in order will be those already mentioned,—namely, abstraction, or volitional attention to a connected train of thought; and reverie, or automatic attention to a spontaneous succession of ideas. In either of these states, the occupation of the mind may be so complete as to produce unconsciousness of all impressions of ordinary intensity,—just as during profound sleep,—together with a great liability to misconceive the nature of any objects that are sufficiently obtrusive to force themselves into notice. The difference between them is chiefly to be seen in the nature of their results: abstraction being subservient to the most important intellectual processes; whereas reverie produces nothing, except an increased liability to its occurrence.

The variety of the objects, to which the consciousness of the human mind may be directed, has led to a division of the attentional states (however induced), founded upon the nature of the objects attended to. Thus, attention to the external world has been called observation; and attention to the internal consciousness,—reflection or introspection. Of these two words, the first has long been in common use; and the second is suggested by Dr. Carpenter as an improvement upon

it. In these pages they both will be employed; but in somewhat different significations: reflection, for attention to the operations of the mind on subjects unconnected with the individual organism; and introspection, for attention to the ideas suggested; directly or indirectly, by bodily sensations.

Whatever may have been the causes operating to induce attention, or whatever may be the nature of the objects upon which it is bestowed, there does not appear to be any necessary limit to their number, provided they are all connected by some obvious link. This existing, the attentional state may become widely comprehensive, even though the person attending is, as it were, deaf and blind on all subjects external to a certain boundary. In illustration, it may be pointed out, that the attention bestowed upon a single object of vision, as upon a person performing some action attended by peril, will, apparently, not be diminished by any complication of the circumstances in which he is placed. For instance, a man immersed in water, and struggling for life, would be likely to engross entirely the thoughts of a spectator; and to produce temporary unconsciousness or forgetfulness of all other matters. But if, from each of two or more places on the shore, a boat were put off to attempt his rescue, they would all be taken cognizance of, and their various chances of success would be noted from time to time. For this purpose, it is evident that the observation must, so to speak, travel constantly from point to point; visiting in distinct succession each object that could be separately noticed; and leaving the spectator ignorant of its movements, only

in consequence of their extreme velocity. Certain games of skill, as chess or whist, furnish very similar examples; the attention that is said to be given to the game, being given, in point of fact, to a great number of detached particulars; which may require to be examined again and again, or each of them but once, accordingly as they do, or do not, possess a successional relation towards each other. At the same time, notwithstanding that the attention thus embraces many objects of a kindred nature, the state of reverie or of abstraction may be complete, so far as regards all matters unconnected with them; and may precisely resemble that which is produced by the fixation of the consciousness upon one idea only. The same principle may be applied to all the less marked forms of attention; and, when combined with the influence of habit in giving direction to the thoughts, it is instrumental in producing a result with which all persons are practically familiar,—namely, that the constant exercise of one kind of attention diminishes the aptitude of the mind for others. The application of this fact furnishes an excellent means of testing the correctness of any proposed classification of the attentional states; inasmuch as all divisions, that are based upon real difference, will be found to hold an antagonistic position towards each other. Thus, it is proverbial that very minute observers are seldom gifted with the faculty of close and logical reasoning; and, on the other hand, that men of a highly intellectual turn are generally deficient in the power of observation:—a few brilliant exceptions serving to render the general truth of the statement more apparent. But

there is no possible kind of observation that would not greatly assist in the formation of observant habits; or that would fail to increase the attention paid to objects of every class. The increase would doubtless be most evident with regard to the class especially attended to; but it would speedily become much more general. It may be assumed, safely, that the detective police are the most observant body of men that it would be possible to select; and yet their especial motive is the recognition of the persons of criminals.

Among all the various forms of attention, the one by which the foregoing remarks are most strikingly illustrated is that which I have called introspection; and which is limited to the ideas suggested by bodily sensations. It will be described at greater length hereafter, when treating of hysteria and hypochondriasis; so that, at present, nothing need be said concerning it, except that the persons whose lives are spent in the gratification of their appetites, or in the contemplation of their emotions and sensations, are commonly heedless of events and obtuse of understanding; but possessing, at the same time, remarkable cunning and contrivance about whatever can further their desires. They show at once, the predominance of their habitual method of attention over the other operations of the mind, and the comprehensiveness of its grasp with regard to all that can promote its exercise.

It still remains to describe, and to endeavour to explain, the effects which are produced by attention upon those persons who constantly exert it. In doing this, the introspective form is that which will chiefly

require notice; inasmuch as the effects of habitual reflection or observation are almost limited to the production of increased mental capacity and vigour, *quoad* these processes respectively. The attention, however, that is bestowed chiefly upon the body itself, will often be found to work most important corporeal and intellectual changes; to the study of which it will now be necessary to proceed.

The effect of introspective attention upon the body is manifested by muscular movements, by the production or modification of sensations, and by various changes of nutrition and secretion. Its more common modes of operation appear to be greatly promoted by a feeling of expectancy with regard to the particular result that is to follow; and to be equally retarded by an opposite frame of mind,—but this circumstance may perhaps be explained by the influence that doubt or disbelief would necessarily exert upon the attentional state itself, diminishing the tenacity of its hold, and withdrawing the consciousness from the main object, by the suggestion of irrelevant ideas. It is quite evident that attention, directed to some part of the body in the confident anticipation of a definite change there, might easily be of an automatic character, and would probably be complete and undisturbed. But if the occurrence of the change were doubtful, and still more, if it were thought to be unlikely, the attention bestowed in order to produce it would of necessity be purely volitional; and the full exertion of the will would be interfered with by the conflicting ideas entertained with regard to the result. Hence, attention would be much more powerfully excited and steadily

attached, in the former case, than in the latter; and any effect of which it was a cause would be brought about more quickly, in precise accordance with this important difference. It will be seen, hereafter, that expectancy has little to do with many of the consequences of attention; and, for this reason, I am inclined to believe that, in all cases, the operation of this feeling is chiefly or entirely that of a help in the direction and fixation of the consciousness; so that the required mental state being rapidly and certainly induced, its effects will follow with proportionate speed, and almost with equal certainty.

Until within the last three years, the best illustrations that could have been given of muscular movements produced by attention, would have been the oscillations of a suspended coin or ring, and the movements of the divining-rod. Recently, however, the magnetoscope of Mr. Rutter has shown the operation of the same principle under circumstances permitting greater scope and diversity of action; and, more recently still, the phenomena of hat and table-turning have greatly increased our practical knowledge of its results. The experiments last referred to, inasmuch as they are not yet thoroughly understood by the public, will be left for discussion in the concluding chapter of the present section; and the facts that are to render them intelligible may be sufficiently exemplified from the first-named sources of information.

The oscillation of the coin or ring is commonly described by saying that, if either of these bodies be suspended by a silken thread, and suffered to hang within a drinking-glass, the other end of the thread

being held between the finger and thumb, and the hand being kept perfectly still ; the coin or ring, after coming to a state of rest, would begin to oscillate, and would at last strike the side of the glass, doing this on opposite sides alternately, until it had struck the hour of the day, and then returning to quiescence. The divining rod need hardly be described. It is a forked twig of hazel, which, when held in a particular manner, by both hands, is supposed to indicate, by its movements, the presence of subterraneous springs, or of concealed veins of metallic ore. The magnetoscope, a more pretentious instrument than either of the former, consisted essentially of a body suspended and free to oscillate ; but in contact with the hand at the point of suspension. For a time it was believed, by some persons, to indicate, by the direction and force of its movements, the nature of the various substances brought into its neighbourhood ; and its delicacy was said to be such as to detect the difference between different homœopathic globules, the precise character of the oscillation varying as these globules were successively placed beneath the pendant body, and being always the same for those of the same kind. It was announced, also, that a suspended watch would perform very remarkable movements ; and especially that, if its string were held by the finger and thumb of one hand, while the other was placed a little below the watch itself, a swinging motion would commence, in a direction from north to south, when the palm of the lower hand was turned upwards ; and from east to west, when this position was reversed. Of these experiments, the first two were ancient and familiar ; but

the others were invested with all the attractiveness of novelty; while the ease with which they could be tried, and the success which generally attended upon them, led great numbers of people to test the reality of the phenomena for themselves.

The effect of the different globules upon the magnetoscope, did certainly, at first sight, appear very remarkable. The believers in homœopathy were greatly rejoiced, declaring that they now had conclusive proof of the power of their medicines to do something; and that they had also, for the first time, a test of the authenticity of these medicines, by which they might be sure that each globule really contained an infinitesimal portion of its professed active ingredient. Persons better informed, who knew that homœopathic globules were made, like seed comfits, by the bushel; and then distributed into bottles differently labelled (the manufacturer never troubling himself to go through the farce of pretended medication), waited with some curiosity for the real explanation of the affair; and it was not long before they were fully gratified. Dr. Madden, who had tried a number of experiments with the magnetoscope; and who had proposed to himself to determine exactly what movements each kind of globule would produce, was at length induced to prove his results by globules of the nature of which he was ignorant. In doing this, he was constantly led into error; and was compelled, at last, to admit that the movements of the magnetoscope were entirely governed by his own expectation. If a globule of aconite were placed under the instrument, and if Dr. Madden knew what it professed to contain,

then the movements would be such as aconite had formerly produced. If, however, Dr. Madden erroneously believed the globule to be mercurial, the movements formerly associated with mercury would recur; and if he had no idea of the professed ingredient, the movements would be altogether uncertain.

With regard to the coin or ring, the watch, and the divining rod, careful experiments have always been followed by precisely similar results; and it may be stated, as a matter of certainty, that the movements in all these cases are purely automatic; and that their direction and force are entirely determined by the idea of them that is previously formed in the mind. Whatever this may be, the movements will conform to it; so that they may be modified or controlled by erroneous impressions on the part of the experimenter. If nothing be expected, nothing will happen; and the pendant body, or the divining rod, will remain motionless, except for that slight quivering of the muscles which cannot altogether be restrained. If the eyes be bandaged, it is impossible, without their aid, to give sufficient attention to the thing held, for any definite movements to take place at all. If the person holding the string be mistaken in the hour of the day, his mistaken belief, and not the reality, will determine the number of strokes upon the glass. In every case, it is the idea that is fulfilled, and that produces involuntary muscular movements; of which the individual is commonly unconscious, partly because automatic actions often fail to excite sensation, and partly because the attention is too much occupied with the result, to take heed of the means by which it is accom-

plished. In performing such experiments as these, it must be remembered that, in the generality of cases, some practice will be required in order to obtain success. Persons in whom the will is comparatively feeble, and whose consciousness is commonly attracted by objects, rather than directed by themselves, will experience the smallest amount of difficulty, and will often succeed, even upon the first trial. But those who, although accustomed to guide their mental operations by volition, have never acquired the power of abstraction in its higher degrees, will find it no easy task at first, entirely to concentrate the attention upon so trivial a thing as a swinging button; and, until this entire concentration is obtained, the conditions necessary for a successful trial will not have been fulfilled; and the results likely to follow from them cannot, reasonably, be expected. In many instances, however, want of patience or want of knowledge has been the evident cause of so-called failure; and the very possibility of the attentional movements has been discredited by those who might speedily have witnessed them, if they had taken the trouble to proceed in the right way.

Passing on now from muscular movements to sensations, it may be observed, in the first place, that the effect of attention in rendering them more acute, and the effect of diversion of the mind from them in diminishing their intensity, is a matter of daily experience to the great majority of mankind. Acting upon this principle, if an agreeable impression be made on the sensorium, as, for instance, by the fragrance of flowers, people commonly stop and attend to it, in order to

increase their enjoyment. The increase may be partly accounted for by the greater quantity of scented air that is inhaled; and by the manner in which it is detained within the nostrils for examination; but without doubt it is chiefly due to the direction of the consciousness upon the sensory impression. Again, nothing is more common than to witness temporary forgetfulness of pain, as the result of close attention to matters unconnected with it. Hence, the friends of the sick are accustomed, as far as may be possible, to divert their minds from the contemplation of their sufferings; observing that, under the influence of mental occupation, these sufferings either cease to be felt, or, at least, are felt in a less degree of severity. It will often happen, however, that a question, or a casual expression of sympathy, by carrying back the mind to the part that is diseased, will restore the pain in as much intensity as at first; and, for this reason, patients will seldom confess, and, perhaps, seldom even know, the amount of benefit that they have actually received. A great number of similar instances might easily be related, but it is so obvious that a sensorial impression could not produce its full effect unless attention were directed to it; and, on the other hand, that such an impression, in common with other objects, would be neglected by an individual in a state of abstraction or reverie, that it is not necessary to enter more fully into detail, with regard to a principle so simple in its causes, and so familiar in its practical application.¹

¹ The well-known lines in 'Rokeby' express Sir Walter Scott's knowledge of the fact that emotional attention will cause the re-

There is, however, some evidence in favour of the belief that the attentional state will actually produce sensations. If the open hand be held up before the eyes, and the mind be steadily fixed upon the tips of the fingers, feelings of creeping or tingling will soon be perceived in them, and will extend themselves through the hand and arm if the effort be continued. After a certain amount of practice in the direction of the consciousness, some persons requiring less, and others more, sensation may be excited at pleasure in any part of the body. The feelings experienced are variously described by different individuals; and, from the very nature of language it would be difficult or impossible to convey any exact idea of them. It must be regarded as at least probable that the movement of the circulating blood, among the ultimate fibrils of the sensory nerves, is the proximate cause of these sensations; and that they are thus produced as a consequence of impressions, precisely in the ordinary way. The impressions being extremely slight, and of continual occurrence, it is quite conceivable that special attention should be required in order to develop them into absolute sensations; and it is plain, moreover, that they would be first produced (that is, recog-

cognition, as definite sensations, of impressions so slight as to be otherwise undistinguishable :

“ Far townward sounds a distant tread,
 And Oswald, starting from his bed,
 Has caught it, though no human ear,
 Unsharpen'd by revenge or fear,
 Could e'er distinguish horse's clank,
 Until it reach'd the castle bank.”

nized) in those parts of the body which are most richly endowed with tactile sensibility. Next after the hands or fingers, the teeth are the organs in which these latent sensations are most easily called forth; but, after due solicitation, they may be found wherever they are sought, and the only difficulty in the way is to fix the attention with sufficient steadiness, or, prior to experience, to subdue the counteracting influences of doubt.

The effects of Attention upon the processes of Nutrition and Secretion, present a great generic resemblance to those already described as resulting from Emotion; but, from the very nature of the attentional state, they are generally wrought more gradually. "It seems certain," says Dr. Carpenter, "that the simple direction of the consciousness to a part, independently of emotional excitement, but with the expectation that some change will take place in its organic activity, is often sufficient to induce such alteration, and would probably always do so, if the concentration of the attention were sufficient." The removal of disease by remedies which possess no real efficacy, but which the patient believes to be sufficient for his cure, such, for instance, as charms, or homœopathic globules, is a phenomenon constantly witnessed by the medical practitioner, and only to be explained by the expectant attention that is aroused.¹ When

¹ The following example of the effect of expectant attention in working a bodily change, is selected from among many that are on record, and appears to be well authenticated. A woman suffering from a swelling which she supposed to be cancerous, and which had resisted treatment, came to London for the purpose of con-

the idea attended to is of a depressing kind, its effects are often most injurious,—actual disease being sometimes established by the action of an erroneous belief in its existence. The results thus brought about, whether good or evil in their character, are frequently real and tangible; tumours and other morbid growths being absorbed and caused to disappear; functional derangements of the severest character being entirely rectified; and, on the other hand, absolute organic disease being, not uncommonly, produced. In most cases, however, the attentional state is complicated by emotion; and, indeed, it is hardly in human nature to await with perfect tranquillity “some change in the organic activity of a part.” The patient who confidently expects a cure, is naturally animated by feelings of hope, gratitude, or exultation; and the miserable hypochondriac, who disorders his digestive organs by thinking about them, is commonly a prey to grief and despondency. Perhaps, after all, the manner in which attention modifies the structure of the body, is by maintaining an emotional state of mind, and by constantly guiding its force into the

sulting an eminent physician, who, on examination, promised her a complete and speedy cure. He wrote a prescription for some local application, which was to be kept constantly in contact with the affected part, and then sent his patient back to the country. Being accustomed only to the practice of apothecaries, the woman did not know that the prescription was an order for medicine, and regarded it as the direct agent by which the cure was to be worked. She therefore carefully protected it by an outer covering of flannel, and applied the written side to her swelling, which, under the influence of the cabalistic characters, soon began to diminish, and ultimately disappeared.

same channel of discharge. It may fairly be assumed, as the nature of the effect is in all cases determined by the nature of the idea attended to, that the act of attention only determines in what organ or part the effect shall be produced. That this directing power is often exerted, in cases of strong emotion, does not admit of doubt;¹ and perhaps, under a less degree of excitement, an habitual influence of the same kind might be traced. The most evident difference between Attention and Emotion, in their effects upon Nutrition, is that the force of the former does not seem to be exhausted by the production of material changes; but,

¹ The author has elsewhere related ('Pathology and Treatment of Hysteria'), upon what appears to him to be credible testimony, the following very remarkable instance of the power of attention to direct the injurious action of a violent emotional shock. A lady, in perfect health, who was watching her little boy at play, saw a heavy window-sash fall upon his hand, cutting off three of the fingers; and she was so much overcome by terror and distress, as to be unable to render him any assistance. A surgeon was speedily obtained, who, having dressed the wounds, turned his attention to the mother, and found her half stupefied, but moaning, and complaining of pain in her hand. On examination, three fingers, corresponding to those injured in the child, were discovered to be swollen and inflamed, although they had ailed nothing prior to the accident. On the next day, the inflammation had proceeded so far, that incisions were required to permit the escape of matter; and some time elapsed before recovery was established. Now there can be no doubt that, in this case, the violent perversion of the ordinary nutritive operations, or in other words, the inflammation, was the direct result of strong emotional excitement; and that the part to suffer was selected in consequence of attention being fixed upon it, by its correspondence with the part injured in the child.

on the contrary, to gain strength by exercise; while any permanent alterations that it works may be regarded as the results of a continued effort, rather than of a sudden shock. I am inclined to believe that, in many cases of slight emotion, the only effect produced, in the first instance, is automatic attention to the idea which forms one element of the emotional state; and that, in time, an abiding emotion is produced, which may be lost sight of by the consciousness, even while it is working changes in the body. If this view be a correct one, the state of expectant attention would admit of analysis. The emotional element would supply the power by which the ordinary operations of the nervous system were perverted; and the act of attention would exert a twofold influence, prolonging the emotion by keeping the mind fixed upon it, and directing the current of force towards the organ in which the change was looked for.

The effects of Introspective Attention upon the mental faculties, will require to be particularly noticed hereafter, in describing certain of the diseases of the nervous system, and in explaining the principles and objects of moral education. To save repetition, therefore, only the general character of the influence that is exerted will be mentioned in this place; and there is little to add, with regard to it, to what has been said already. The continual direction of the consciousness upon matters of a personal kind, such as the sensations, emotions, and desires of the individual, to the exclusion of other subjects of observation or thought, has an inevitable tendency to deaden the perceptions and to paralyse the mind. It produces a

condition in which the faintest sensation, or the most trivial idea connected with self, will destroy the feeble efforts at volitional attention, and will lead away the thoughts into unresisting captivity. Introspection, although it is generally commenced by an effort of the will, yet manifests a tendency to become automatic, greater than that of any other form of the attentional state. Hence, its predominance over the powers of observation and reflection, when once established, is likely to go on increasing; and, if it commence in early life, its results, both intellectual and moral, are frequently of the most distressing kind. The principle upon which it acts has already been laid down, in mentioning the antagonistic character of different methods of attention; and illustrations of the way in which this principle is carried out, will be abundantly furnished in the sequel.

CHAPTER V.

NERVOUS DISEASES.

BEFORE attempting to explain the manner in which education may be applied to the prevention of certain diseases of the nervous system, it will be necessary to give some account of what those diseases are, of their essential characteristics, and of their ordinary methods of attack. In doing so, it is not intended to enter into any technical, or strictly medical, questions; but only to furnish such explanations as will serve to link effects to their causes; to render intelligible the course of action that will hereafter be advised; and to give a clear and distinct conception of the evils that it is desired to guard against.

In the first place, it must be remarked, that diseases of the nervous system, visibly impairing its functions, may fairly be divided into two great classes; of which the first will include those produced by mechanical or physical agencies; and the second, those in which no such agencies can be traced. In the one case, the cause is always external to the nervous centres, and is commonly independent of them; in the other, it is generated, as far as can be discerned, in consequence

of their own operations ; and probably within their own structure. The first class will not, it is evident, include any disorders which education can prevent, or, in their essential features, even modify ; and the brief reference made to them will be intended rather to indicate the province of the physician, than to engage the attention of the general reader. The second class, however, caused in great measure by unnatural excitement of the feelings, or by perverted direction of the thoughts, will require a full and careful notice ; inasmuch as the diseases comprised in it afford scope for the exertions, and occupation for the mind, of the parent, at a time when medicine is powerless to avert their progress, and is not yet required in order to palliate their effects. To these diseases, therefore, the present chapter will be chiefly devoted ; and the others will only receive such cursory notice as will avoid confusion between the two, and will render apparent the differences that distinguish them. For this purpose, and in order to illustrate the operation of mechanical and physical agencies, it will be sufficient to refer to the effects of pressure ; and of certain poisonous substances.

When pressure is made upon the trunk of a nerve, if moderate in degree, it produces pain, or uneasy sensation of some kind, which is always referred to that part of the body where the compressed filaments are finally distributed. This result is frequently experienced from compression of a nerve trunk passing along the thigh, and whose branches terminate in the foot. After sitting in a position that subjects this trunk to pressure, either from the edge of a chair or

from any other hard substance, a remarkable and very disagreeable tingling is felt throughout the foot; and that member is said to have been asleep. It is worthy of notice, however, that the pressure is seldom borne sufficiently long for this sensation to be produced, unless the attention has been so much occupied about some other matter as to have disregarded those first slight intimations of discomfort, which would, in the ordinary state of consciousness, have caused an immediate change of posture. Compression of one of the nerves of the arm, as it passes below the elbow, is well known to produce a tingling similar to that mentioned above; but referred, by the person feeling it, to the little, and ring-fingers, of the hand whose arm is pressed upon. These sensations speedily cease when the pressure causing them has been neither severe, nor long continued; but, if it have exceeded certain limits in either of these respects, the sensations may last for days, or even weeks; thus showing that some positive damage has been done, which requires time for its removal. Under a pressure still more severe, the effect would be to suspend the functions of the nerve; or even to crush and destroy its texture. In either of these cases, the parts supplied by it, beyond the seat of injury, would be completely cut off from sensation, and would be incapable of voluntary movement; the possibility of recovery, and the period required for its accomplishment, being questions that would depend upon the nature and extent of the original mischief.

Pressure upon the spinal cord, if made gradually, interferes with the sensations, the voluntary move-

ments, and the nutrition, of all the organs whose nerves depart from the cord below the point of pressure; and, if maintained or increased, it commonly annihilates the first two faculties altogether, and produces the condition called spinal paralysis, or paraplegia; in which the healthy parts of the body may be separated from the diseased by a *horizontal* line. If the pressure be low down in the back, the legs only will be affected; but if it be in the neck, the arms and trunk will also be rendered useless. Wherever it may be, the paralysed parts will be devoid of feeling, the patient will have no power to move them, and, both from loss of nervous energy, and from disuse, they will waste very speedily. The absence of sensations, and the incapacity to execute movements, are the unavoidable results of severing any organ from the brain; and, in some cases of paraplegia, where this severance has been incomplete, one or other of these faculties has continued to exist, although perverted and impaired. When the spinal cord, although pressed upon at some point, is in its natural state below, the phenomena of purely spinal, or reflex, action are commonly exhibited by the lower part; but these have been so fully described already, as not to require a further notice.¹

¹ One of the most remarkable cases of paraplegia on record, is that of John Carter, of Coggeshall, in Essex, who lived for several years without sensation, or voluntary movement, either in the legs, body, or arms. During his long confinement, he amused himself, and earned the means of support, by making sketches in Indian ink, chiefly copies, but remarkable for their beauty and delicacy of execution. He was accustomed to hold his pencil between his

Pressure upon the brain (or rather, as the different organs affected cannot be distinguished by any difference in symptoms, pressure upon the contents of the skull,) is in all cases followed by very marked symptoms; and usually by complete loss of sensation, and of the powers of motion and thought. The person will lie as if in a profound sleep, from which he cannot be aroused. The acts of breathing, and of swallowing, will be performed automatically and unconsciously; the latter of them, of course, being excited only by the contact of aliment with the throat. The offices of the sympathetic system, and the processes of nutrition generally, are not of necessity interfered with; so that, if the pressure be not accompanied by laceration or other injury to the brain, and if food be put into the mouth in sufficient quantity, and in a state ready to be swallowed, life, in one sense of the word, may be prolonged for an indefinite time; and recovery may even take place, if the cause of pressure can be completely removed.¹ But these conditions are seldom

teeth, and the paper being fixed upon a desk, which rested on his chest, the wished-for lines were produced by movements of his head. His wife remained near him during the drawing, in order to take the pencil from his mouth when more ink was required, and to replace it there when filled. An account of John Carter's life during his illness, has been written by the Rev. — Dampier, the incumbent of Coggeshall. It is illustrated by some engravings from Carter's drawings, and has been published in London within the last few years.

¹ A sailor was once admitted into the Dreadnought hospital ship, in the state of unconsciousness described in the text; and the persons who brought him had no knowledge of his history. On examining his head, a fracture of the skull was discovered, attended

fulfilled; and it generally happens, either that the torpor extends to the centre of respiration, and that death is produced; or else that tardy and imperfect recovery may occur, attended often by imbecility of mind, and almost always by some degree of paralysis; usually affecting a lateral half of the body, and thus marked off by a *perpendicular* line, and not, as in the spinal cases, by a horizontal one.

It may be observed, also, with regard to the contents of the skull, that the most injurious pressure appears to be that which is exerted directly downwards, and that lateral pressure is comparatively harmless. With regard to all parts of the nervous centres, there is great toleration of any pressure that is very gradually produced,—as, for instance, by the slow growth of a tumour; but, perhaps, under such circumstances, a process of compensation may occur, and the yielding of other structures may afford room for those that appear to be most modified.

As an actual matter of fact, in the causation of by depression of the bone. The depressed bone was raised by an operation, and the man was perfectly restored to health. It was then discovered that he had received the injury about a year before; and that the intervening time had been completely lost to him, by reason of his absolute unconsciousness. His life had been much of the same kind as that of a limpet, or an oyster, only approximating more to the vegetable type, in consequence of the absence of sensation; and if his friends had forgotten or neglected to put food into his mouth, he would have been starved to death without knowing it. Yet this man, by a surgical operation that he could not feel or be aware of, and that occupied only a few minutes, was once more placed upon a footing of perfect equality with his fellows.

disease, pressure is produced by an infinite variety of circumstances. Most of these may be included under four heads : namely, fracture or displacement of bones ; effusion of blood within, or around, the nervous tissue ; the growth of tumours ; and the swelling, or the deposits, consequent upon inflammation. By one or other of these, all ordinary cases of apoplexy or paralysis are produced ; and besides them, there are some others, whose occurrence is more rarely met with.

The effects of poisonous substances will, in the next place, require to be described ; and they will be found to possess a very extended range of activity, and to modify, in some way or other, every function to which the nervous system is subservient. It is probable that, in every case, they find their way into the blood before affecting the nerves ; and they may either be introduced artificially from without, through the stomach and other channels ; or generated within the body, under conditions that are little known or understood. It would be tedious and unnecessary, even if it were possible, to mention all the various poisons by which the nervous system may be influenced ; but a few of the most prominent will be cited as examples, commencing with those that are of external origin.

The alkaloid strychnia, the active principle of the *nux vomica*, or bean of St. Ignatius, possesses an extraordinary control over the motor apparatus. When this substance has been swallowed, or otherwise administered, in sufficient quantity, the slightest impression upon an afferent nerve of motion is followed by violent muscular action, producing extreme general

rigidity, alternating with periods of relaxation. This state of things continues (under the influence of a poisonous dose), until death is produced, either simply by exhaustion, or by the stop put to respiration from the chest being fixed during the time of spasm. Dr. Hall has found by experiment, that, if a frog be poisoned with strychnia, and then placed in a dark and quiet cellar, the violent movements will not be produced, for want of the initiatory impression; and the reptile will remain quite still, until the poison has been carried out of its system, and recovery has taken place. If, however, the cellar be shaken by a stamp of the foot, the spasmodic attacks immediately commence; thus showing that strychnia does not actually cause convulsion, but only an irritable state of the motor centres, which leads them to respond, with unusual force, even to the slightest impressions. If the impression be altogether withheld, the effect of the poison is rendered nugatory.

A class of narcotics that may be exemplified by the hemlock and the foxglove, exert a powerfully sedative effect upon the functions of organic life; diminishing the frequency of the respiration and of the heart's action, lowering the tone of the pulse, and decreasing in every way the animal vigour and activity. On the other hand, ammonia and the ethers have precisely an opposite influence; and might be used as antidotes to the operation of the first-named agents.

The effect of chloroform in abolishing sensation is so well known, as one of the greatest discoveries of the present century, that few words will be required in describing it. From the volatile nature of the

drug, and from the readiness with which it is absorbed by the membrane of the lungs, it is usually administered by inhalation ; and, in the first stage of its action, it simply benumbs the ordinary tactile sensibility. A certain amount of feeling still exists, and the organs of special sense are scarcely, if at all, affected ; so that a patient may be aware of an operation by the sensations of the part, without their being painful ; and may follow, with his eyes and his intelligence, everything that is done to him. But, if the inhalation be continued, the power of the will over the succession of the thoughts is speedily weakened or suspended ; and ideas pass through the mind, much as they do in dreaming, without any regular or connected sequence, or even any visible link of association. The patient usually gives expression to them as they come, and is often keenly alive to impressions conveyed through the sense of hearing ; perhaps beginning to answer the remarks that are made around him, but being led off at a tangent before his sentences are completed. Sometimes, the action of the brain is less rapid, and then the course of thought may be entirely guided by external suggestions, conveyed either by words, or otherwise. If the dose be still farther increased, the brain and the sensorium are both brought into the most profound repose, and the gentle action of the heart, and the slow and quiet breathing, are the only signs to indicate that life continues to exist. In a few minutes, the extreme volatility of the chloroform causes it to be thrown off from the system ; and the patient rapidly retraces the steps of the process, and returns once more to his ordinary state of being.

The substances that are in common use, as narcotics and stimulants, among all the nations of the earth, although differing from each other in some respects, have, on the whole, much similarity of operation. Opium, Tobacco, Hachish, Ammonita Muscaria, all weaken or destroy the power of the will over the current of ideas; and produce a rapid succession of pleasing but fallacious images. Sometimes, however, the key-note of the thoughts appears to be struck by external suggestion, and to be dependent in some degree upon the objects that are presented to the consciousness, at the time when the influence of the narcotic reaches a certain point. This is especially the case with opium, and the Chinese, who chiefly use it, are very careful to surround themselves with pleasant objects at the commencement of a debauch; and to exclude everything that could produce a painful impression. A certain amount of narcotic action may be likened to that state of reverie, in which enthusiastic people build "castles in the air," their attention being withdrawn from the realities around them, and fixed upon the creations of their own fancy. Perhaps it may be conceded that a refuge of this kind, affording temporary shelter from the storms of life, may sometimes not be undesirable; and the experience of every age and country proves how eagerly it will be sought. Undoubtedly there are cases in which the attention is engaged automatically by the affairs of business, and by the anxieties or other painful emotions that are connected with them; and in which nutrition is so seriously impaired as to justify the medicinal use of a sedative, to assist in withdrawing

the mind from the subjects of its habitual contemplation. But this necessity is fearfully abused by many persons, who, consuming narcotics in a quantity far greater than their needs, or even consuming them in the absence of any requirement at all, do but prepare a punishment for themselves. The miseries that are thus entailed, the broken health, the wasted body, the enfeebled mind, must have been observed, or heard of, by almost every reader; and it forms no part of the present subject to describe or dwell upon them.¹ Sufficient has been already said to show what marked effects such substances will cause; and it is only necessary to add, that, when they are first taken, these effects are not the same as they become, after a certain toleration of the poison has been established. Thus, tobacco produces sickness, and opium profound sleep, in persons who are unaccustomed to their operation.

The next poison to be noticed is alcohol, the active principle of all spirituous, vinous, and fermented drinks; and one of the most fruitful sources of disease and suffering to mankind. When taken in moderate quantity, its immediate action is that of a stimulant, both to cerebral, and organic, nervous activity. Ideas chase each other rapidly through the brain, a genial glow is diffused over the body, the action of the heart is

¹ Readers who desire farther information with regard to the sources and the actions of narcotics, may obtain it from Mr. de Quincy's 'Confessions of an English Opium Eater;' from the work of M. Moreau, 'Du Hachisch et d'Aliénation Mentale, Etudes Psychologiques,' Paris, 1845; and from the papers entitled, 'The Narcotics we indulge in,' recently published in 'Blackwood's Mag.'

accelerated, and the pulse increased in strength. At the same time, the digestion of food is promoted; and these immediate effects are followed by sound and refreshing sleep. The effect upon the brain is not so remarkable as that of the vegetable narcotics; for the associations by which ideas are linked together are usually to be traced; although they are often rendered somewhat fanciful, and are more usually subservient to wit than to reasoning. Volition, too, is not so much suspended, as induced to be passive; so that wine leads a man to disregard caution, rather than deprives him of the power of being cautious. But when, as too frequently happens, the pleasures of moderation lead to the practice of excess, a new set of consequences is rapidly developed; the superior nervous centres being rendered unable to perform their functions, and not being restored until time, and the processes of excretion, have removed the offending matter from the system.

The injury that is done to the health by hard drinking, does not appear to depend so much on the effects of alcohol upon the nervous centres, as on its unwholesome character as an article of diet. It is in great measure carried off by the agency of the liver; and, therefore, by greatly increasing the labour of that organ, it increases, in like manner, its liability to disease. Its antiseptic, or preservative, properties, moreover, cause it to retard the various changes by which effete matters are removed from the body; and, consequently, to produce an unnatural and injurious retention of them; while it necessarily exhausts nervous power by excessive stimulation, and thus

weakens the tone of the digestive organs. In this way, by the combination of a disordered liver, poisoned blood, and impaired nutrition, it saps the very foundations of life, and involves all the organs of the body, and all the faculties of the mind, in one common and irremediable ruin.

There are still certain poisons to be mentioned, that appear to have no connexion with the nervous system, except through the injurious influence they exert upon it; but which are either generated within the body, or else introduced, from without, in some imperceptible form, and through some subtle agency. Of these, the state of the blood which exists in a person of rheumatic habit; the malaria which produces ague and other periodic disorders; and the poison of smallpox or fever, may serve as familiar examples. The first, by its operation upon the motor centres, involves an especial liability to convulsive disorders; the second is frequently attended by agonizing pain of the facial nerves; and the last is a common cause of delirium.

The diseases in which physical or mechanical agencies, although sometimes accessory, do not appear to be essential; and which are caused, in great measure, by unnatural excitement of the feelings, or by perverted direction of the thoughts, will furnish the next subject for consideration. These diseases have been classified, and have received names, with reference to the particular faculty whose functions present, in each, the most marked symptoms of disorder; and they are, therefore, spoken of, as affecting either sensation, or motion, or thought, or that general harmony of organic action which has been attributed to

the working of the sympathetic. But they will be found in many instances to fade, by imperceptible degrees, into each other; and it is very seldom that one of them exists alone. Nevertheless, it is usual, in works on medicine, to describe and discuss them separately; and to assume (if I may say so) certain lines of demarcation that are scarcely found in practice. For the sake of clearness and convenience, the same method is here adopted; and, for the purposes of description or of treatment, it does not involve any error of importance. When two or more nervous diseases are combined, or, to use more exact language, when different kinds of disorder are found together, one of them is usually so predominant as to justify the application of its name; and to require the treatment most appropriate for its cure. Beyond this statement it would be scarcely safe to venture, inasmuch as there is little evidence on which to found a real and permanent distinction between many of these disorders, although they may display, at times, widely different symptoms. Such questions, however, are not suited for discussion in these pages; and they are hinted at, rather for the purpose of showing some of the difficulties by which the whole subject is surrounded, than with any intention of pursuing them farther. The nervous diseases to be described at present will be taken as if from typical examples of their respective varieties; and those only will be included which arise spontaneously. The artificial diseases,—such as the mesmeric trance, and the various conditions analogous to it,—may be considered with greater advantage after their natural types have been made

familiar to the reader; and they will, therefore, be reserved for separate examination in the ensuing chapter.

Diseases of sensation may evidently be arranged into the two classes of excess and deficiency, pain and numbness. The former, when existing without any structural change in the affected nerve, and without any evident physical cause, is called neuralgia; and when occurring in the face, is commonly known as *tic douloureux*. Putting aside the causes of neuralgia that have already been referred to, it may be produced, in many persons, by the simple contemplation of a part that is thought to be diseased. Thus, it occasionally happens that small tumours form in places where they escape notice for a time; and these, when they are at last discovered, very frequently become painful, although no other alteration may take place in them. In the same way, the attention bestowed by hypochondriac persons upon their digestive organs, is a common cause of neuralgia affecting them; and described as pain in the side, or pain in the stomach, while its exact position can scarcely be defined, and its immediate causes are seldom traceable. Cases are recorded of persons who erroneously believed themselves to have received some severe bodily injury, and who made piteous complaints of pain, until they were undeceived. One of these is quoted by Dr. Carpenter in the following words: "A butcher was brought into the shop of Mr. Macfarlan, the druggist, from the market-place opposite, labouring under a terrible accident. The man on trying to hook-up a heavy piece of meat above his head, slipped, and the sharp

hook penetrated his arm, so that he himself was suspended. On being examined, he was pale, almost pulseless, and expressed himself as suffering acute agony. The arm could not be moved without causing excessive pain, and in cutting off the sleeve he frequently cried out; yet, when the arm was exposed, it was found to be quite uninjured, the hook having only traversed the sleeve of his coat." I have met with an account of an instance similar to this, which happened to a wood-cutter, who chanced to bring down his axe across his foot, cutting through its coverings, and producing, as he thought, a gush of blood. The man suffered as much pain as the butcher; but, on examination, he was found to have sustained no injury; the axe having only penetrated as far as some red baizé, which was wrapped round his foot between the boot and stocking. Dr. Carpenter remarks, that such instances as these illustrate the "absolute creation of subjective sensations, by the belief in the existence of their objective causes;" but pain, in the cases where it is *gradually* developed by attention, may probably be ascribed to actual impressions upon the nerves of the part, rendered more intense by the direction of the consciousness. Diminished sensation, dependent upon moral causes, can scarcely be regarded as a disease, although it will occur now and then as a complication of hysteria. But it is well known how decidedly the feelings will affect the power of physical endurance; and how easy it is, comparatively speaking, to bear pain, when assisted by a belief in its utility, or by a prospect of its speedy abatement. The attention can then be withdrawn from it while it lasts; and

its consequent diminution is a phenomenon precisely similar to the increase of such sensations as are steadily regarded.

The Diseases of Motion form a much larger and more important class than those of Sensation; and, like them, are characterised either by excess, amounting sometimes to convulsion; or by deficiency, amounting sometimes to paralysis. Of the former, the most simple, and the most frequent, is that known as Chorea, or St. Vitus's Dance. This disorder is almost confined to children, is most common between the ages of eight and fifteen years, and occurs more often in girls than in boys, in the proportion of four or five to one. Its most prominent symptoms consist of "tremulous, irregular, involuntary, and ludicrous motions of the muscles of voluntary motion, more marked on one side than the other, and unattended by pain." With these there commonly coexists a weak and unhealthy state of body; and, in a very large proportion of the patients affected, there is an hereditary constitutional taint of a gouty or rheumatic character. Dr. Copland, whose description of the movements is quoted above, compares the derangement of volition and muscular motion to that of the mind in mental alienation. He says, also, "Owing to the irregular convulsive motions of the face, jaw, head, and neck, of the trunk and extremities, and from the circumstance of these motions taking place at different times, the patient has a jumping, starting, or palsied, walk, and cannot perform the usual occupations of the extremities with the steadiness and regularity of health. The characteristic motions vary in degree; but they are always

present during the continuance of the disease, excepting while the patient is asleep, when, in most instances, they altogether cease."

There is very little to add to the above simple and graphic account of the choreic movements. After reading it, no one can possibly fail to recognize the disease. It may be mentioned, however, that the power of originating a movement is not interfered with, even in cases where the power to direct it is totally lost. A child will extend the hand, if told to grasp some object placed before it; but the hand will always be diverted, more or less, by the disease, and drawn above, below, or to the side, in spite of efforts to guide it correctly.

The most remarkable circumstance connected with chorea is that, generally (and, I myself believe, in every case without exception), the attack is produced by some kind of emotion. In young children this is usually fright, or distress at the reproofs of a parent or teacher; but in elder ones, and especially in girls, it is often a sort of anticipation or foreshadowing of the feelings of womanhood, of a kind which they themselves may scarcely realize, or be able to admit, but which a close observer may detect, as exerting a considerable control over their thoughts, and as being cherished, perhaps almost unconsciously, and certainly without acknowledgment. Feelings of this kind are commonly automatic; and the extent to which they influence the conduct is seldom perceived by the subject of them, although it may be very apparent to the lookers-on. To say that they exist without the knowledge of the individual, may appear, at first sight,

to involve a paradox ; but, nevertheless, such is frequently the case. In point of fact, persons often do not realize, or fully understand, the nature of their own feelings towards others, until long after these feelings have existed, so to speak, in secret, and have produced a marked effect upon the conduct. And, in girls, whose emotional susceptibility is always great, and often excessive, the existence of feelings that do not easily express themselves in action, and that are not imparted to companions, is a fertile source of nervous disorder ; the concealed emotion discharging itself, at last, through the body, and usually selecting the organ which is the least able to oppose it.

The history of a case of chorea, then, would usually commence by an account of some derangement of the general health ; often so slight as to attract but little notice. The complexion would, perhaps, be more pallid, and the flesh less firm, than usual ; but the parents would look forward to some intended change of air, as to a measure calculated to restore the natural condition and appearance. Their opinion would, probably, be correct ; but, in the mean while, a certain excitability or irritability of the nervo-muscular apparatus of voluntary motion has been produced as the effect of bodily weakness ; and this, if acted upon by emotion, is liable to be developed into the symptoms of chorea. The effect of the gouty or rheumatic habit of body, is, probably, to predispose to that state of system, in which chorea may be established in consequence of slight emotion ; but there is great reason to regard the emotion as the essential cause, and the feeble health, or the rheumatic habit, as circumstances

that render the body less able to resist its influence ; and that, therefore, promote the occurrence of the disease, without being in any way necessary to its production.

The emotions to which children are commonly subjected, and which precede the development of chorea, are not very complex ; but they may easily escape observation. Sometimes, of course, they lie upon the very surface of the case, and their effects follow them immediately. I have seen chorea completely established within a few minutes after a sudden alarm ; and, once, during the course of a trying music lesson ; but, in the majority of instances, some morbid state of feeling has existed for a considerable time. Besides the emotions already referred to, which often come into play before they are suspected, children may be the subjects of many feelings that fear or shyness will lead them to conceal. Terror at night, depending either upon simple dread of solitude and darkness, or upon distressing dreams, or upon the tricks and falsehoods of nurses and attendants, is a source of disease that should be guarded against most carefully. Anger, too, arising from a sense of injury or of injustice, or from some of the many circumstances by which the delicate *amour propre* of a child may be wounded. Other emotions may, doubtless, be recognized in individual cases ; and the chief requisites for their discovery are a recollection of the probability of their occurrence, and the careful employment of attention in the search.

Generally speaking, chorea yields without much difficulty to medical treatment ; but, in the absence of any recognition of its real causes, it is very liable to

recur, even again and again. The children who suffer from it are commonly of highly sensitive disposition (although this is not always apparent); and, if they are subjected to a continuance of injurious influences, the disease appears to fasten upon them with increased readiness. A first attack of chorea is seldom produced without pre-existent ill-health; but a subsequent one will often depend upon emotional cases alone; as if the very fact of the original surrender had increased the susceptibility of the nervo-muscular system, and had diminished its power of resistance.

Unnatural movements of greater energy and severity than those of chorea, and occurring in paroxysms, rather than continually, are usually described as Convulsions. The diseases of this kind are various in their causes and their methods of attack; and frequently depend upon excessive irritation of the extremities of motor nerves. Infantile convulsions, produced either by the presence of improper or undigested food in the stomach, or by the pressure of growing teeth upon the gums, will illustrate this kind of disorder; and there are some convulsive affections which depend upon positive changes in the centres themselves. Others, again, are thought to be due to the presence of certain poisons in the circulation. But with all these varieties the present volume has little or no concern; and they are only mentioned in order that no farther notice of them may be required. Convulsive diseases produced by emotional or moral causes, will have to be again referred to, in the description of hysteria; but, for perfect examples of their occurrence, it is only necessary to mention the manner in

which they have often affected enthusiastic religious communities. "In the west of Scotland, in 1742," says Dr. Copland, "a number of persons were attacked nearly at the same time, when hearing the addresses directed to the imaginations and passions of their hearers by the followers of Whitfield; and always when impressed by the denunciations of vengeance and hopes of salvation which they set forth. The mental agony which was thereby induced, gave rise, in many, to the most violent tremblings and agitations of the body, which were frequently preceded by faintings, and followed by convulsions, and subsequently by sobbing, weeping, and crying aloud." Similar instances might easily be multiplied, from the experience of the founders or zealous propagators of many religious sects; and the Methodist body alone could furnish them in great numbers. Perhaps their most remarkable feature is their tendency to spread among those who witness them; so that one susceptible person may cause a whole congregation to be attacked, although they would have escaped but for his example. It will be seen in the sequel, that ordinary hysteric fits exert the same kind of influence; which, in them, has been commonly referred to the effect of an imitative propensity.

Deficiency of motor power, or paralysis, depends, in the majority of instances, upon the occurrence of some organic change in the nerves or nervous centres; or upon pressure exerted on them from without. It is, however, an occasional consequence of emotional changes; and one that occurs as a complication of hysteria, more frequently than as a solitary disorder.

The diseases of Thought, comprising, as they must necessarily do, all the forms and varieties of insanity, or alienation of mind, afford a very extended subject for consideration, and one which is obscured, as far as the public is concerned, by an enormous mass of prejudice and error. The repulsive character of some of the manifestations of lunacy; the fear with which the unhappy sufferers are too often regarded; the anxiety to avoid, for friends or kindred, the slightest imputation of the disease; and the dislike which human nature must always feel at the sight of man deprived of his highest faculties; these are circumstances which have all combined against the insane, and have surrounded them with an atmosphere of mystery. The general ignorance on all subjects connected with their condition and management, has given the rein to imagination; and has allowed the writers of romance or drama to travestie their sufferings for the amusement of the idle. The grave nonsense, too, that has been uttered by crotchetty *experts* in courts of law, touching questions of moral or criminal responsibility, has seemed like an *ignis fatuus*, sporting over morasses that were too deep for common sense to fathom. The limits of these pages will only permit the most superficial notice of the principal features of mental derangement; and will entirely forbid the smallest approach to matters of detail. But an endeavour will be made to state such general principles as appear to be clearly established; and to simplify, as far as may be possible, the method of applying them to the frailties and passions of humanity.

And, in the first place, it may be said, that to define Insanity is perfectly impossible. No one has ever succeeded in devising a form of words that will separate the healthy mind from the diseased, or that will afford a satisfactory test of either state. Comprehensive definitions include the whole human race; restricted ones shut out, in some direction or other, evident instances of mental unsoundness. It would be difficult, perhaps, to convey an idea of what is meant by insanity, better than it is done by the language of the ordinary medical certificate; which states that "A. B. is of unsound mind, and a person proper to be placed under care and treatment." But these words might well be applied to a vast number of people whom they are not intended to reach; and, between the man of judgment and the lunatic, we find the gambler, the enthusiast, the drunkard, and the criminal. In attempting, therefore, to describe the essential features of insanity, and to reduce them to a form of words, it is necessary to afford great latitude, and to adhere to the use of the most general terms; remembering, always, that the question of mental derangement must be decided upon the merits of every single case; and that the best standard of comparison, for each individual, will be furnished by his own history, and his past conduct; and by the change that has taken place in his mind, rather than by the point at which it stands, or the motives that appear to govern it.

Although insanity may make itself apparent in a great number of methods, and although the range of insane delusion may be almost infinitely various; yet

there is by no means a corresponding diversity in the nature of the disease itself, or in the essential character of the change by which the natural balance of the faculties is disturbed. It has been said by Dr. Conolly, "that all the forms of mental disorder are dependent on one of three states of the nervous system,—a state of increased, or a state of diminished, or a state of unequal excitement of that system;" and that "all other forms of insanity appear to be mere varieties, or complications, or results."¹

Proceeding onwards by the light of this statement, it will be found that there are three distinct forms or phases of mental disorder, traceable, either singly or in combination, through all the protean aspects that such disorder may occasionally assume. Mania, or the state of increased excitement, presents, as its most remarkable features, a total suspension of the power of the will over the action of the brain; and (as the result of the excitement) a continuance of this action with great rapidity, and without those intervals of rest that occur in the condition of health. From these it follows that ideas pass through the mind in very quick succession, and without any regular order of sequence, or evident connexion; while, at the same time, it is quite impossible, by any volitional effort, to detain one of these ideas, or to follow it into any particular channel of association. This state is described as incoherence; and it involves, during its continuance, the entire suppression of all the mental

¹ Lecture on the 'Characters of Insanity,' delivered at the Royal Institution.

faculties. There is no Attention, no Comparison, no Judgment; but ideas, prompted by external or internal suggestion, determining the bodily actions during their brief predominance, and giving way to those that follow them. The patient, if uncontrolled, will wander about, and vociferate, and perhaps commit acts of violence; but his conduct is not guided by any specific design, and is scarcely a subject of knowledge to himself. Melancholia, or the state of diminished excitement, is characterized, as its name implies, by despondency and indifference. The patient loses all pleasure in the past, all interest in the present, and all hope in the future. Occupations that once were pleasing, lose their charm; society becomes irksome, friends are avoided, duties are left undone. Self accusations of the most terrible kind add to the misery of the sufferer, religion ceases to afford consolation, and self-destruction is usually attempted, often with the greatest ingenuity and perseverance. Blended, more or less, with either of these conditions, although quite conceivable without them, is the state of Delusion, requiring, as it would seem, the last of Dr. Conolly's essential changes,—the *unequal* excitement of the nervous system.

In order to realise the idea of this inequality, it must be remembered that the formation of correct and sound opinions, about objects of sensation, depends upon the proper and harmonious performance of many distinct operations. In the first place, the sensation itself must be correctly *felt*; and must engage the *attention* of the person feeling it. Then it must be *compared* with sensations formerly expe-

rienced, and requiring an act of *memory* for their recall. The memory will next be taxed for the objects or conditions with which the former sensations were associated; and a comparison will again require to be made, between the past and the present, with regard to them. Now it is quite plain, that the inaccurate performance of one step of the foregoing process might be sufficient to vitiate the result, and to produce a mistaken belief, or, in other words, a delusion. For instance, a person deficient in musical ear, may be easily misled about the identity of a tune; and one possessing but slight knowledge of a language, may err, unconsciously, in the delivery of a message. In these cases, the fault would chiefly rest with the memory, by which the past sensorial condition had not been recalled with exactness; but it is evident that any other break in the process might serve to produce the same general result. The erroneous belief of a sound mind, however, admits of being easily dispelled by a demonstration of the truth; and the mistake about the tune or the message would be corrected by another comparison between the real and the false. But the delusions of the insane cannot be removed in this way, because the sufferers are incompetent to make the necessary exertion of their faculties. If there be a tendency towards mania, the brain speedily wanders from the matter in hand; if towards melancholia, attention cannot be called to it at the first. And as, in nearly every case of insanity, there is an unnatural exaltation, or impairment, of sensation, or memory, or imagination; so there will be, in nearly every case,

some evidence of delusion; mistakes being made about the nature and purpose of external objects; or, very frequently, subjective sensations, arising from internal changes in the sensorium, being mistaken for the effects of impressions from without. In this way a lunatic may believe that persons speak to him, and urge him to commit certain actions; or he may believe in the reality of spectral illusions; or he may be deceived with regard to any of those particulars of human knowledge, which require for their attainment the co-operation of distinct faculties of the mind.

It has been shown by Dr. Carpenter that the delusions of the insane are commonly produced by their emotions; or, in other words, that they are the result of their former habitual feelings with regard to the questions involved in them. Thus, a man of cheerful disposition and sanguine temperament would be apt to believe in his own great prosperity; and a morose or suspicious person, in the existence of a conspiracy to injure him. The emotional attention to one class of ideas invests them with undue importance, and disturbs the balance of the judgment with regard to them; while the impairment of volitional power prevents this balance from being restored by the unaided efforts of the individual.

It will be seen, therefore, that insanity resolves itself into the absence or diminution of natural self-control; and that the change may be most evident with regard either to the succession of the thoughts, or the government of the feelings. In the former case we speak of intellectual, in the latter of moral insanity;

not intending to express any essential or generic difference between the two, or any limitation of the disease to the intellect or to the passions ; but only to describe the tendencies of the individual, and the general direction of his departure from health. Where the moral insanity predominates over the intellectual, there it is likely that the habitual feeling may retain some one erroneous impression prominently before the mind ; and, in some instances, this may be so remarkable as to obscure the other manifestations of insanity, and to suggest the idea of monomania. But, in strict language, monomania is hardly possible. The insane, when under the influence of an emotional delusion, often retain sufficient power of will to conform their words and actions, by a strong effort, to the standard of those around them, so long as their emotion is not called into play ; but, if they are carefully and skilfully examined, more extended mental disturbance may always be found out. And it is hardly conceivable that the powers of comparison and judgment should be at fault, with regard to some particular species of evidence, while at the same time they are unimpaired and undisturbed, so far as all other ideas and objects are concerned. By satisfactory proof of one insane delusion, a belief in some radical imperfection in the reasoning powers is immediately suggested to the mind ; and this belief is found to be entirely supported by the results of careful observation and extended experience.

The continued existence of insanity, and especially of the more active forms of mania, has a tendency to exhaust and wear out the brain, by incessant perverted

exercise, and by the want of sleep, so as to change the nature of its organization, and to render it, by virtue of gradual structural changes, unable to perform its various offices. Hence arises a state of perfect imbecility or fatuity, resembling that which nutritive changes sometimes produce as the result of old age alone; and analogous, in the condition of the patient, to simple idiocy, in which the brain has never been called into the state of healthy action.

The position of the insane with regard to moral and criminal responsibility, and with regard also to their control over property, involves several questions of much interest and importance, that still occupy the attention of legislators and physicians. In courts of law, there is generally an evident inclination, on the part of the judge, to treat lunatics as criminals; and, on the part of the medical witness, to treat criminals as lunatics. In the civil courts, however, this order of things is often reversed; the lawyer maintaining that delusions should not invalidate an equitable distribution of property; and the doctor, that lunacy should altogether destroy the right to a disposing power.

With regard to criminal responsibility, the English law absolves only those persons, who, at the time of committing the act charged to them, were incapable of distinguishing right from wrong, or of perceiving the consequences of their actions. By this rule, no immunity is afforded to a man who labours chiefly under moral insanity, and who murders another in revenge for a fancied injury. The argument would be, that although the prisoner laboured under the

specific delusion that he had been injured, still he knew that the law would afford him redress, and that it discountenanced, and would punish, revenge. Even if the injury were real, the law would be the only proper engine of retaliation, and the sufferer would always be punished for taking it into his own hands; so that the victim of a fancied injury could not reasonably be permitted any privilege that does not attach to the man who has actually sustained one. There can be no doubt that this state of the law acts beneficially, in furnishing the morally insane, or persons approaching to that condition, with an additional motive to restrain their desires, and to keep the peace; and there can be no doubt, also, that punishment may fairly be employed, in order to check those actions, on the part of the insane, that would be injurious to others, and, *by consequence*, pleasurable to themselves. There are, however, certain insane impulses, in which a person shall be, as it were, driven to the commission of homicide, or some other act of frenzy, and shall have a distinct knowledge of his guilt, and an expectation of his detection and punishment; but yet shall not possess sufficient volitional power to stay his hand, or to refrain from the deed to which he is impelled; and which, in such case, would appear to be a matter of necessity, and not of choice or of gratification. Such impulses as these are commonly the effect of suggestion from without, acting upon a disordered intellect and an impaired volition, and producing a dominant idea, which develops itself in action, independently of any feeling of desire, and

even, sometimes, in spite of efforts to resist it.¹ The evident dominion of an insane impulse should always be recognized as a complete protection against the legal consequences of the actions it may prompt; but the practical difficulty in admitting such a plea, rests upon the difficulty of obtaining proof of the impulse, and of guarding against the dangerous impunity for the guilty, that might arise from too great readiness

¹ Dr. Carpenter mentions a circumstance that has been related to him, and that remarkably illustrates the influence of suggestions derived from external sources, in determining the current of thought. During an epidemic of fever, in which an active delirium had been a common symptom, it was observed that many of the patients of one particular physician were possessed by a strong tendency to throw themselves out of the window, whilst no such tendency presented itself in unusual frequency in the practice of others. Dr. Carpenter's informant, himself a distinguished professor in the University of Edinburgh, explained this tendency by what had occurred within his own knowledge, as follows:—His friend and colleague, Dr. A., was attending a patient, Mr. B., who seems to have been the first to make the attempt in question; impressed with the necessity of taking due precautions, Dr. A. then visited Dr. C., *in whose hearing* he gave directions to have the windows properly secured, as Mr. B. had attempted to throw himself out. Now Dr. C. distinctly remembers, that although he had not previously experienced any such desire, it came upon him with great urgency as soon as ever the idea was thus suggested to him; his mind being just in that state of incipient delirium which is marked by the temporary dominance of some one idea, and by the want of voluntary power to withdraw the attention from it. And he deemed it probable that, as Dr. A. went on to Mr. D., Dr. E., &c., and gave similar directions, a like desire would be excited in the minds of all those who happened to be in the same impressible condition. ‘Principles of Human Physiology,’ 4th edition, p. 835, note.

to assume its existence. Hence the usual, and probably the safest method of procedure, is to test each occurring case by its own merits, and by the evidence; always regarding the idea of impulsive insanity with much suspicion, and requiring probabilities little short of demonstration, before receiving it in extenuation of a criminal act; but being ready to admit its possibility, and to consider without prejudice the statements adduced in its support. It should be remembered, that an insane impulse is not necessarily attended by delusion, but that it essentially consists in absolute loss of self control. Delusion alone cannot absolve from criminality, except with reference to an act that it immediately and instinctively suggests; as, for instance, injury to another person, produced by a mistaken belief in danger to be apprehended from him.

With regard to civil rights, the very slightest degree of insanity should be held to require their absolute suspension. It is commonly in the early stages of the malady, when it would scarcely be recognized by a casual observer, that property is squandered, and injurious extravagance displayed; while this same period is that which most demands judicious treatment, and separation from injurious influences. Insanity is a disease that increases fearfully by indulgence, or by vexation incident to improper restraint; and days that are lost, before sending the patient to an asylum, will always be multiplied in the duration of his attack. A week of unrestrained wandering, or even of imperfect management at home, will often increase by months the length of the eventual confinement; so

that, in the treatment of the insane, there is no cruelty equal to the mistaken kindness of delay. On all accounts, therefore, whether for the benefit of the individual himself, or for the benefit of his dependents and of society, the earliest symptoms of insanity should be acted upon by those around him ; and should justify the deprivation of personal liberty, and the loss of control over his actions and his property.

In the matter of testamentary arrangements, a similar deprivation of rights is not imperatively required. The last will of a lunatic should always be open to dispute, but it should not be set aside, except by manifest injustice or delusion. An insane person may often dispose of his property in accordance with determinations formed, long previously, in his mind ; and retained there, notwithstanding his disease, in consequence of the attention that has been given to them. A will, made in this manner, would often be better adapted to the particular circumstances of the case, than the alternative provided by the law, in its general arrangement of the property of the intestate. And, even where a will bears upon itself the conclusive evidence of mental unsoundness, it should still be respected by a tribunal, if equitable and just in its essential particulars. It should be regarded as an evidence of intention on the part of the testator, to be followed wherever consistent with propriety ; but liable to be reversed when exhibiting delusion, or to be modified when betraying infirmity.

When insanity has existed for any length of time, it is invariably attended by evident changes in the brain, or in its investing membranes. These changes

are probably due to the connection between increased or diminished excitement, and increased or diminished circulation and nutrition; and should be regarded as the effects of the disease, rather than as its causes. Their presence would always place a great obstacle in the way of amendment, and must often serve to maintain and perpetuate the irritation in which they have had their source. But the causes of insanity must be sought in a different direction, and chiefly in that surrender of the dominion of the will which becomes, when confirmed, the essence of the malady. Men prone to emotion, men of anxious temperament, men of enthusiasm, all suffer the succession of their ideas to be removed from their own control; and to be guided by the conduct of others, by external circumstances, or by the attractiveness of the objects that surround them. These things should all occupy the mind in their turn; but none of them should hold it prisoner, or should interfere with the freedom of its operations. Too often, however, the lively fancy and fertile imagination of the genius, subjugate his will as the slave of his ideas; too often, the cares of the world forbid the man of business to rise superior to their burden; and, too often, the ignorant and the illiterate have never been other than automata, satisfying the passions of their animal natures. Those in whom volition is thus suspended, will become insane under an unusual degree of their accustomed mental stimulus. Like idle swimmers, who have floated into a current too powerful for them to stem, they may make desperate efforts to reach the shore, but the stream will ultimately sweep them onward in its course. The

power of self-control, abandoned in trifles, and forfeited by disuse, can seldom be recovered in the day of trial; and it is the want of it that converts the vicissitudes of fortune, or the anxieties of life, into efficient causes of insanity. In the eloquent language of Dr. Conolly: "The violent emotions and passions of the mind, and propensities rendered masterly by indulgence, and the undue and exclusive employment of certain intellectual faculties, tend to produce disturbances in the functions of the brain,—to confuse the reason, to disorder the affections, and to degrade man to the dust. The reason and sense which we boast of should be employed, therefore, to secure *itself* amid the shocks and blows incidental to the battle of life; and to guide the whole mind temperately through the sunshine and the storm. Well-ordered affections, well-directed aspirations, worthy and practicable objects, the pursuit of truth, and the desire to do good,—these things exercise but do not discompose the understanding. Patience under trials which must come to all, and a trustful hope of a higher life after this life,—these things do not lead to mental derangement. But all vehement passions, and mere worldly ambition, and frettings and envyings, and jealousies and care, and fits of wild impulsive enthusiasm, however directed,—these things carry tumult into the brain, and lead to madness."

The methods by which volitional power may be increased, and habits of self-control acquired, will come under discussion in the sequel; and, having now briefly glanced at disorders chiefly affecting the three great functions of the nervous system, it is time to turn to one in which these functions are often disturbed

simultaneously; and in which it is very difficult to assign the locality of the morbid action.

This disease, the last that will require description, commonly presents an exceedingly compound character, and a most diversified range of symptoms, including either the reality or the semblance of almost every possible nervous disorder; and frequently simulating the diseases of other parts and organs. It is almost confined to the female sex, although of occasional occurrence in man; and it has received the general name of Hysteria.

The various methods in which hysterical disorders may be displayed, have occasioned most confused and contradictory notions regarding them; but these may be cleared up, in some degree, by observing the phenomena from different points of view.

In the first place, there is a large class of young females, naturally of sensitive character and disposition, and prone to emotional excitement, who are said to be *hysterical*, or, vulgarly speaking, *nervous*, as a general term, and independently of any specific derangement of their health. Such persons are easily alarmed, and any trifling illness that may befall them is usually heightened by undue anxiety about its event; while its individual symptoms are increased, by emotional attention to the manner of their occurrence. Wakefulness is apt to be induced by the same causes; and this reacts upon, and increases, the general irritability of the system. Trifling symptoms, and slight sensations, that would be unheeded or forgotten by most patients, are anxiously noted by these, are maintained and aggravated by the action of the mind,

and are carefully detailed to the medical attendant. But this artificial heightening of illness is seldom of long duration; and it disappears when the patient is rendered confident of recovery. In visiting such persons, therefore, the first object of the physician is to discover what proportion of their symptoms is really due to efficient causes of disease; and what, to an hysterical exaltation of the reality. The latter portion he would almost place out of his account, in estimating the severity of the case, or the prospect of recovery; and he would say to the friends that this or that pain or complaint was not of a serious character, but only hysterical; meaning that it was not the result of any morbid change of a permanent kind. The public, however, when receiving such an opinion, are apt to confound the word "hysterical," with an idea of unreality, and to suppose that the symptom referred to is the effect of fancy; whereas it may be perfectly real to the person suffering from it, and only unimportant, from the manner in which it is produced, and the facility with which it may often be removed. The word hysterical, therefore, as used to describe the general character of a patient, should be understood to signify that she has not sufficient energy of will to prevent slight emotions from determining the nature of her thoughts; and that, this being the case, any symptoms of bodily illness will be greatly increased by the combined agency of fear and attention. As a class, domestic servants are particularly liable to suffer in this way, because the small amount of their pecuniary earnings renders real illness a matter of serious anxiety to them,—their habits of bodily activity cause

enforced idleness to be excessively wearisome,—and their lack of the mental resources afforded by education, prevents them from turning to the contemplation of acquired knowledge, as a means of diverting the attention from self.

Passing on from the adjective to the substantive, it will next be required to describe Hysteria itself; and in doing so, the hysteric fit must be taken as its essential feature. This is a convulsive attack, varying very much in its severity and its duration, usually preceded by a sensation as of choking, or as of a ball rising in the throat; and liable either to be cut short by a gush of tears, or to continue for a considerable time, and to terminate in prolonged sleep, or trance, or catalepsy, from which the patient will at last recover, returning, apparently, to her usual state of health.

This hysteric fit, or paroxysm, on the first occasion of its occurrence, is always the direct and immediate result of mental emotion. Like chorea, it often depends upon fright, and often upon some feeling or passion that has been cherished and attended to in secret. In its slightest form, it consists only of the sudden movement and the hasty gasp that are produced when excitable persons are startled by some unexpected sensation. In its more declared examples, the movement becomes convulsion, and the gasp becomes a continued sobbing; the difference being probably due to the greater force of the emotion that is developed. This force, if considerable in amount, and if obtaining at first no outlet but in movement, is apt to produce a violence of exertion that greatly exhausts the nervo-

muscular apparatus; and that terminates in a sort of stupor, by reason of the necessity for repose. But when glandular, as well as muscular, action is excited, as for instance in the flow of tears, complete relief is much more quickly afforded to the system, and the attack is commonly brought to a speedy close.

The hysteric paroxysm often furnishes a striking example of the effect of attention in guiding emotional force to some specific outlet. If several women or girls are together when alarmed, the occurrence of a fit in one of them is almost certain to be the signal for its immediate commencement in many others. This effect depends upon the same principle that is illustrated by the case of the lady mentioned at page 174, *note*. The strong impression made upon her mind by the nature of the child's accident, localized the influence of her terror and distress; and the strong impression made upon the minds of a party of women by the sight of hysteric convulsions, occurring under circumstances exciting to them all, serves to determine a similar effect as the result of their own exalted feelings. This effect has frequently been referred to an imitative propensity; but it must be quite evident that, under the ordinary circumstances of its occurrence, the minds of the sufferers have been too much occupied by attention to the events around them, to have had any desire to imitate, or knowledge of a purpose in doing so. Their imitation must necessarily have been automatic; and, as the word is commonly used to signify designed action, it is an evident and indefensible perversion of language to apply it to that which is involuntary. The

same may be said of chorea, or of any other form of emotional convulsion, each of them having a tendency to reproduce itself in other persons, by the influence of suggestion alone, and by overcoming the will, rather than by guiding it. To call this imitation, is to confound together things that are essentially different, and to obscure, by an improper description, the whole range of hysterical phenomena.

In a very large majority of instances, the above-described hysteric paroxysm works out its own termination, and completely exhausts the force by which it has been produced. It often leaves behind some slight and temporary stomach derangement, the effect of energetic exertion, or of the disturbance of the general harmony of organic action; and it always establishes a weak point in the system, so as to recur very easily, and in consequence of a slight re-application of its exciting cause. When its effects are thus limited, it may be distinguished as *primary* hysteria.

Sometimes, however, the emotion that has been called forth, whatever its character, is not expended by the production, or forgotten after the occurrence, of a single hysteric paroxysm. Either it has been of a nature powerfully to attract the attention, and thus to be retained before the mind; or, perhaps, it may have been recalled, and the consciousness again directed to it, by the occurrence of a connected incident. At all events, in some way or other, an abiding emotion may have been aroused; and such will often maintain a modified hysterical condition, to which the name *secondary* hysteria may, with propriety, be applied.

The occurrences which characterise this form of the

disorder may be so numerous and diversified as scarcely to permit description, consisting, in different cases, and sometimes, even, successively in the same individual, of a disturbance of every recognized function of the nervous system. There is scarcely a sensation or a faculty that may not be involved in its turn; and that may not suffer either increase, or diminution, or perversion, or change in its relations with the rest. It follows, therefore, that symptoms resembling those of other forms of nervous disease will frequently present themselves; and that chorea, or epilepsy, or hydrophobia, or insanity, may all be simulated with greater or less exactness. Among the mental changes that are occasionally observed, some curious forms of double consciousness are the most remarkable. In these, the mind alternates between two different phases of existence; and has no knowledge, in either of them, of the occurrences that have happened in the other. Sleep, or simple suspension of consciousness; trance, in which the mind is directed upon internal changes, and entirely withdrawn from outward objects; catalepsy, in which there is perfect consciousness, but no power of speech or motion; all these have again and again been witnessed. It would almost seem as if the malady consisted in an unequal distribution of the general nervous force, among the several organs which it calls into activity; and as if this distribution were liable to be changed, although not equalized, by many trivial events. For the various manifestations of disordered action change rapidly into each other, and vary even from hour to hour; the transitions often appearing to be spontaneous, or, sometimes, to be

governed by external circumstances. And the whole disorder, severe as it may often be, seldom produces any permanent or organic changes; and, apart from a natural tendency to wear itself out, may be removed, often with great celerity, by a beneficial alteration in the emotional state of the patient. One of the most remarkable of these cases has been placed on record by Dr. Carpenter, who relates that "the exciting cause of the disorder lay in the disappointment of affections long cherished in secret, but the nutrition of the nervous system had been previously impaired by anxiety and excessive mental exertion. The first access of the disorder was kept off by the influence of a very determined will; but when the malady had fully developed itself, it resisted every kind of treatment for four years. A slow and almost imperceptible improvement was taking place, when circumstances occurred which gave a new turn to the feelings; a fresh attachment was formed, which was happily reciprocated, and from that time the cure rapidly advanced."

In the production either of primary or of secondary hysteria, the power of emotion must act in direct opposition to that of will; and must be strong, in exact proportion to its weakness. Perhaps, if volition were habitually cultivated, and if it were employed against emotion by turning the force into other channels of activity, hysteria might always be prevented; and certainly its occurrence would be very rare. But, as society is constituted, there are many emotions which often overpower even a strong will, in the production of the primary forms of the disorder; those

which are attended by surprise being especially apt to do so. And, when a permanent emotion is called into active existence, and an energetic volition is brought to bear against it, the latter, if exerted in a simply repressive direction (as was probably done in the case mentioned by Dr. Carpenter), is nearly sure to be worsted at last ; and the system, in such case, weakened and exhausted by the powerful effort that has been made, falls an easy victim to the future course of the malady. Moreover, the actual energy of the will, and probably, also, its means of operating upon the system, are so intimately connected with the general vigour and health of the body, that this is found to have an important bearing upon the question ; and, from the general coincidence of impaired health with hysterical disorders, the former has been supposed to be an essential element in their causation. They have even been ascribed to the operation, upon the nervous system, of a poison generated within the body, and dependent either upon some constitutional taint, or simply upon derangement of nutrition. With these opinions, however, the author can by no means coincide ; and he believes that the effect of bodily illness, in promoting the occurrence of hysteria, is strictly limited to a diminution of the power to resist emotion ; and that it may be measured by the degree in which the strength is reduced, without much reference to the nature of the disease reducing it.

There is yet another form of hysteria to be described, presenting many points of resemblance to those noticed above ; and also many points of essential diversity. The chief of these are due to this, that the

emotional cause of illness neither fixes itself upon the attention by its attractiveness, nor overrides the ordinary functions of the nervous system by its power; but is retained before the mind by a volitional effort, and has its effects solicited, instead of their being striven against. This form may be called *tertiary hysteria*, and the method of its production may be made more clear by reverting to the account given, in a former chapter, of the effect of emotions in developing the expressions of the countenance. It will be remembered, that any passion immediately produces movements of the muscles of the face; that the habitual passion sets the face, so to speak, into the mould of the movement that is frequently occurring; and that persons desirous to imitate the aspect of a passion which they do not feel, accomplish their object, not by endeavouring to make a face, but by thinking of the feeling in question, and surrendering their features to the influence of the idea. The first expression is precisely analogous to the primary hysteric paroxysm; the cast of countenance bears some resemblance to the continued effects of a powerful and protracted emotion; and, just as it is possible to obtain any required expression by thinking of the feeling proper to it, so tertiary hysteria is excited by thinking about any of those emotions by which a primary paroxysm has been, or might be, produced. And as, in the absence of real feeling, it is much more easy to affect the countenance by passions that can be recollected, than by such as have to be imagined (young and joyous people, for instance, finding it no easy task to express by looks a sympathy which they

do not experience; while those who have felt sorrow can reproduce and maintain its aspect with little difficulty); so the induction of tertiary hysteria only becomes easy after a primary attack has been brought about in the usual manner. But it is worthy of remark, that the power of remembering or imagining emotions, so as to obtain their effect upon the face, is capable of being greatly increased by practice; a fact which explains the improvement of actors—so far as gesture is concerned. In the same way, either the power of remembering emotions itself increases, or else the excitability of the system with regard to them; for a perfect command of the events of tertiary hysteria can only be obtained as the reward of many trials.

The history of a case is usually something of this kind. A young lady who has been fairly frightened into an ordinary hysteric fit, finds, on recovering from it, that she has excited an unusual amount of interest, solicitude, and compassion; and that this has been done at the cost of very little inconvenience to herself. Perhaps her life is not an exceedingly happy one; she may have been disappointed in her prospects or wishes, or may receive very little sympathy from those around her, or may be the victim of *ennui*; and, in either case, the novelty of the fit, and, perhaps, the pleasurable sensations said to be often associated with it, and the little parade and fuss consequent upon illness, have all combined to afford her gratification, and to furnish her with agreeable recollections. Sometimes the fit may occasion a visit on the same day, or on the next, from some kind neighbour or

relation, to whom the whole story is probably related, and its minutest particulars dwelt upon, in the hearing of the patient; whose original emotion will thus be recalled in so distinct a manner, that she is very likely again to be subjected to its effects. When thus arising, the second fit is seldom so severe as the first; but it leaves a greatly increased liability to subsequent ones, whether produced in the same way, or by fresh causes of excitement. Under such circumstances, it cannot but become a matter of observation to the patient, that the recollection of a certain event, or train of thought, is usually followed by an attack; and it perhaps occurs to her to ascertain, by experiment, whether the association be invariable, or only accidental. She finds that, by dwelling upon the proper subject for a time, and by withdrawing, as far as possible, the usual control of the will from the muscular system, a fit may always be produced; and, having once gained this knowledge, she has many temptations to its exercise. Besides those mentioned above, the exercise of a newly-acquired power can scarcely fail to be a source of gratification.

Among the mental instincts or propensities that are common to the whole human race, perhaps the most powerful of all, especially in the female sex, is the desire for the sympathy of others. This desire, in the higher forms of its manifestation, is not only the great source of social feelings and relations between the individuals and the families of mankind; but it is also a natural monitor, teaching the impossibility of perfect self-dependence, and the benefit of resting upon a wisdom and a stability greater than

those which are given to humanity. But, when directed to low and degrading objects, or gratified only through the gratification of the passions, this desire often amounts to a morbid and insatiable craving, which will be indulged at the expense of any pain or inconvenience, and which furnishes the chief source of continued tertiary hysteria, in all its numerous varieties.

When once a young woman has discovered her power to produce a hysteric paroxysm at will; and has exercised it, for her own gratification, without regard to the anxiety or annoyance it may entail upon her friends, a very remarkable effect is speedily produced upon her whole mental and moral nature. The pleasure of receiving unwonted sympathy, once tasted, excites a desire for it that knows no bounds; and when the fits have become familiar occurrences, and cease to excite attention, their effect is often heightened by the designed imitation of some other disease. Then, in the words of Dr. Carpenter, "pleasure is morbidly associated with many ideas which ordinarily excite pain. The girl, though originally amiable and disinterested, derives a strange satisfaction from the sight of the anxiety, and even the distress of her friends; and, though previously truthful, enjoys the idea of deceiving them." Those who have never witnessed this strange mental perversion, could scarcely be made to credit the extent to which it is often carried, or the nature of the proceedings that it will often prompt.

The self-produced or simulated disorders that may be grafted upon the tertiary hysteric paroxysm, may

supersede it, or may even be called forth, in persons of a certain temperament, without the paroxysm having ever occurred, are divisible into three great classes. The first of these comprises disorders of motion, of the nature either of paralysis or convulsion, and affecting either a single member, or the whole body. They depend upon the steady fixation of attention, upon the part in question, and upon the effect that is desired by the patient; the nervo-muscular apparatus of motion obeying the idea that is thus made predominant. Sickness has often been excited and maintained in the same manner, as also many curious rhythmical movements of the limbs, and, in some instances, their immoveable contraction. The second class comprises changes in the organic activity of internal organs, wrought by continued attention to them; this being produced, either by sensations arising in the organs themselves, or by suggestion, as from hearing of the illnesses of others. This last cause of attention is so powerful, that it positively renders various ailments fashionable among the valetudinarian ladies of large towns; and a physician who announces a new disorder, requiring a plan of treatment calculated to impress itself upon the minds of his patients, is certain speedily to have a number of these ladies under his care. The third class of disorders are those that are entirely simulated, and are, from beginning to end, the effect of imposture. As instances of these, there are cases on record of girls who have bound tight ligatures round their limbs to produce swelling of the joints below; of some who have burnt their skins with corrosive liquids, so

as to produce patches of ulceration ; and of others who have put leeches into their mouths, so as to spit blood, and to imitate the symptoms of bleeding from the lungs. But a volume might easily be filled with their devices, which sometimes occasion them considerable suffering, and are often remarkable for the greatest cunning and ingenuity.

The mental condition of these women is worthy of notice, as exhibiting a degree of introspection, parallel to the abstraction of the most profound philosopher. Their own sensations and desires, and the methods by which they may vary their maladies, often completely absorb their attention, and engross their consciousness. They are occupied, as a general rule, in thinking of what they shall say when asked how they do ; and spend much time in that frame of mind, which is produced, in ordinary persons, by the questions of a physician. It follows, of course, that their higher mental faculties become greatly impaired ; that the knowledge they once possessed is speedily forgotten ; and that all proper occupations become wearisome, and are neglected, as interfering with constant attention to the subject of health.

It is very remarkable, however, and constitutes a dark page in the history of human depravity, that these wretched creatures, although sometimes frivolous, often derive a strange pleasure from the ministrations of the clergy, profess extreme devotion, attend sedulously to religious ordinances, and even practise their impostures in furtherance of the sect to which they belong. If may be, that, after long deceiving others, they at last succeed in deceiving

themselves; or that they yield an automatic and unconscious attention to the sensations connected with the mere unfruitful *emotions* of religion. Self-consciousness does not by any means imply self-*knowledge*; and there are many hysterical women whose introspection appears to be about equally divided, between their bodily sensations, and the feelings or passions connected with the *odium theologicum*. It is very pitiful to see those whose lives constitute an acted lie; and whose utter uselessness is a practical contradiction of their verbal professions; but who, nevertheless, are energetic partisans of some small religious community, and who pronounce, with fiendish malice, or insane bigotry, a sentence of eternal condemnation against all who venture to reject their tenets. In Roman Catholic countries, where miracles find ready credence, women of this class play their parts upon a more prominent stage than is commonly accorded to them here; although even in England, and in this very nineteenth century, cases of wonderful trance, and of supernatural abstinence, have not been altogether wanting. But the performances of the young ladies, whose history has been written by the Earl of Shrewsbury, far transcend those of their most distinguished Protestant rivals; and the *Ecstatica* and the *Addolorata* will be long remembered, not only as striking examples of the ingenuity of tertiary hysteria; but in consequence of the knavery of their accomplices, and the surpassing credulity of their dupes.¹

¹ An amusing account of the devices actually practised by a young woman in London, and within the last few years, may be

Under one of the foregoing heads, it is my belief that all the forms and varieties of hysteria may be satisfactorily arranged. Briefly to recall attention to them, there is, first, the state of general excitability, in which the importance of all ailments is exaggerated, while their symptoms are increased in severity; secondly, a powerful emotion, overpowering the voluntary muscles, and producing a convulsive fit; thirdly, an emotion of an abiding character, maintaining a disordered activity of the nervous system; and, lastly, an emotion which is kept before the mind by a voluntary effort, and the effects of which are solicited, for the sake of the pleasure they afford, or of the desire for sympathy to which they minister.

found in a small volume, entitled, 'The Jesuit in the Family,' which will well repay perusal. It was published under an impression that the heroine of the story was a Romish missionary, and in order to warn the public against her arts. But the suspicion was ultimately shown to have been unfounded, and probably would not have been entertained by persons conversant with the natural history of hysterical imposture, or free from an *extreme* dread of Papal encroachment. In 'The Round Preacher,' (a little book recording the actual experience, as a Wesleyan minister, of a gentleman now in orders in the English Church, and who is well known to, and highly esteemed by, the Author,) an account is given of a case of Methodist "conversion," the incidents of which might well be the first steps in a career of fraud. The subject of it, a young woman, was cruelly treated and made miserable by her parents, as long as she remained "unconverted," and at last, in actual self-defence, she imitated a sort of fit, and professed to have undergone the necessary mental and spiritual change. Her plan, although productive of much secret contrition, was to all appearance successful; but for the details of its conception and execution the original work should be consulted.

Besides the nervous diseases mentioned in the present chapter, there are, as formerly intimated, many others. But it has been an object with the author to speak only of those which are really connected with his subject; which arise, in great measure, from defective mental culture; and which illustrate, by actual and familiar examples, the operation of ideas and feelings upon their own material instrument, and upon the bodily organs at large. To proceed further, would be to trespass upon the domain of strictly medical literature; and to violate the plan of a treatise which professes no more than to guide educators in the preservation of health.

CHAPTER VI.

PHRENOLOGY AND MESMERISM.

Perhaps there are few questions which a medical practitioner is asked more frequently, or which occasion him more embarrassment, than—Do you believe in Phrenology? or, Do you believe in Mesmerism? The inquirers are often so completely ignorant of physiology, that it would be impossible, without the expenditure of much time and labour, to convey to them a clear idea of the state of knowledge on either subject; and so careless in their reception of evidence, that they will assent to anything but the propriety of caution. Partly because the foregoing chapters are calculated to aid the public in comprehending such an explanation as can be given; and partly because the mesmeric phenomena and the nervous diseases fade into each other by imperceptible transition, I am induced to devote a few pages to a statement of the facts, so far as they seem to be clearly established; and to a sketch of the opinions of those persons, whose opportunities of observation, or qualities of mind, render them most able to judge.

Commencing with Phrenology, it is necessary, in

the first instance, to give some account of the doctrines taught by its supporters ; which may be briefly done as follows :—They hold—

That the mental endowments of man depend upon a known and definite number of independent *faculties* ; this number being variously stated, and ranging between 33 and 36 in the systems of different professors. Each faculty is supposed to cause the performance of a certain class of actions, or the predominance of a certain class of ideas ; and some of them to be peculiar to the human race, while others are possessed also by the lower animals.

That each faculty is due to the activity of a separate portion of brain, ministering to it alone, occupying a fixed position, and called “an organ.” There are, consequently, as many kinds of organs as of faculties, and an indeterminate number of each. These organs are distributed over the upper and lateral surfaces of the brain, and extend downwards, in a conical form, into its substance ; but they are perfectly continuous with each other in point of structure, and cannot in any way be distinguished apart. The organs are arranged in pairs, two for every faculty, the hemispheres of the brain being exact counterparts ; but there are no organs on the base of the brain, on the touching surfaces of the hemispheres, or on the touching sides of the deep fissures which pass down into each of them. Every pair of organs is capable of separate uses and independent activity, and the power of every organ depends upon its size only. A large organ forms an elevation on the surface of the brain, a small one

causes a depression, and upon the various combinations of large and small in different heads, are founded the diversities of character; a man's animal, moral, and intellectual constitution being the necessary result of the balance of his "faculties," just as the flavour of a dish depends upon the proportions in which its ingredients have been mingled.

That the organs of the intellectual faculties are situated in the front portion, or "anterior lobe" of each hemisphere; the organs of the moral faculties in the middle portion or lobe; and the organs of the animal faculties in the posterior portion or lobe, situated at the back of the head.

That each elevated or depressed organ causes a similar elevation or depression of the skull, and of the skin and soft parts covering it; the resulting inequalities being discernible by touch and sight; and furnishing, when accurately observed, and judiciously compared, a complete key to the character and qualities of every individual.

The circumstance that the above propositions have ever been gravely discussed and reasoned upon by mankind, would appear in no small degree remarkable to any instructed person who now heard them for the first time. But as they have formerly found advocates among men whose natural abilities demanded respect, and as they have attracted that numerous class, who, "with much curiosity to know what is said, have no sort of curiosity to know what is true;"¹ so a kind of footing has been gained by

¹ Bishop Butler.

Phrenology among the intellectual amusements of amateurs ; and the nature of its position, with regard to the science of the day, is very imperfectly understood by the public. In order to define this position clearly, it will be necessary to begin with the "faculties," and to proceed from them to the organs within the skull, and to the bumps outside of it.

The "faculties" of the Phrenologist, by the operation of which he supposes the actions of the human race to be guided, and all of which he assumes as original and inherent principles implanted by the Creator, are, for the most part, acts or states of the mind of an exceedingly complex character, and resulting from the combination of experience with memory. Thus, to quote a very able writer, "Love of Approbation presupposes an habitual communication of sentiments with other men,—Veneration, a custom of observing and comparing the powers and qualities of different beings,—Acquisitiveness, the general development of the idea of property,—and Cautiousness, an experience of the occasions and consequences of many forms of danger:—and all of them, in short, are so far from resembling primitive and independent faculties, operating through separate organs, and provided each with its own material apparatus in the brain, that we cannot even conceive of their existence till society has made a considerable progress, various tastes and habits been cultivated, and much knowledge been accumulated and diffused. How, then, is it possible to say that any of these is a primitive and independent faculty like seeing or hearing, or any of these that work through outward organs? What

primitive or independent sensations, or ideas, for example, are supplied by Acquisitiveness? Can *they* be conceived to exist, although all other faculties were annihilated? Are *they*, in this respect, or indeed in any other, on a par with the ideas supplied by sight or hearing?—they, that plainly could not come into existence till men had entered into all the competitions of society, and become familiar, not only with innumerable external objects, but with their several utilities and values?”

Another fatal objection to the “faculties” may be founded upon their limitation in point of number; which shuts out many constitutional or acquired peculiarities in individuals, precisely analogous to such as are included. For instance, there is a faculty, and a pair of organs, for love of *food*; but neither the one nor the other for love of *warmth*: a feeling which certainly depends upon similar sensations, excited by similar causes; and whose warnings are equally necessary to the preservation of health and life. Again, there is no faculty or organ for Industry, or for Idleness, although one of these peculiarities of character may often be strongly marked; and may determine the actions of the individual much more certainly than either Hope, or Veneration, or Benevolence. It has been suggested that, as love for children is accounted for by a separate principle of Philoprogenitiveness; so love for parents will involve a principle of Philoprogenitoriness; a Philadelphic principle must be required to explain the attachment between brothers and sisters; and a man who had been cured of colic by laudanum, could not have a

proper esteem for the virtues of that drug, unless, in addition to his memory and common sense, he had been endowed with a separate, original faculty, to be entitled Laudanum—or, perchance, Philanodyneness! In short, the number of faculties might be almost infinitely multiplied; and the new ones would be just as apparent among the diversified aspects of human nature, and would be separated by differences as distinct and important, as Self-Esteem and Benevolence, Conscientiousness and Love of Approbation.

The organs themselves, as material bodies, are not discoverable by any known methods of research. True, there is the brain, with its delicate and complex structure; but of the organs there is not the smallest evidence. The great lateral divisions or hemispheres of the brain, are everywhere covered by their surface of grey matter, the seat, as it is believed, of all active changes; and this surface is extended and increased by means of the folds or convolutions. But these arrangements are found on the inferior aspect of the brain, and on that part of each hemisphere which lies in contact with its fellow; yet, in these situations (forming together about a third part of the whole surface), the phrenologists say that organs do not exist. If not in so many words, they say so virtually, by not recognizing organs there, and by professing that their system is *complete* without them. Moreover, their general statement of the positions of the classes of organs, of the animal, moral, and intellectual, is opposed to a very remarkable fact in comparative anatomy, to which, some years ago, attention was called by Dr. Carpenter. It is ob-

served, in the lower animals, that, when the first rudiments of a brain (cerebrum) are added on to the nervous centres of reflex motion, and sensation, they consist of a representation or analogue of the *anterior* lobes alone. In ascending the animal scale, the anterior lobes increase in size and complexity, and the middle and the posterior pairs are placed behind them by degrees; but it is in man *only* that this progressive increase reaches its climax, and that the posterior lobes are fully developed. Lastly, the "organs" may suffer from gradual disease, or sudden accident, without any perceptible change in the faculties to which they are said to minister. Thus certain parts of the brain may be absorbed, in consequence of the slowly exerted pressure of internal tumours; or may become the subjects of structural change, without any obliteration of Benevolence, or without any limited and defined impairment of the mental powers.

Vague, dreamy, inconsistent, and utterly absurd, are epithets that may well be applied to every hypothesis included in the collective term Phrenology; but to none of them with greater evident propriety than to the doctrine of the external bumps. For, in the first place, the bone of the skull is formed by two layers, having an intermediate cellular space between them, the thickness of which, at any given point, varies greatly in different individuals. It follows that there is no necessary resemblance, not the slightest relation of cause and effect, between the shape of the internal cavity and of the external surface, that there may be a bump outside, with a corresponding bump within, and an internal, opposite to

an external, depression. Indeed, if from any cause, the two tables or layers of the skull are unusually separated at a given point, the separation is likely to be manifest on both sides, rather than on one only. If the tables were unusually approximated, a similar result would follow. Hence it is quite impossible, as a general rule, to connect an elevation of the skull with an elevation of the brain; or to infer the size of an organ, from the form and outline of the surface covering it.

Descending to particular cases, this impossibility, in a head of ordinary shape, attaches with particular force to the (so-called) bumps of Veneration and Self-Esteem; and to those of Form, Size, Weight, Colouring, Number, Order, and Language. The two first-named bumps are located by phrenologists upon two points of the skull, which, at birth, are covered only by a soft membrane, and are called *fontanelles*. During early childhood, this membrane becomes converted into bone; but the precise time at which the change is completed, and the energy with which it is carried on, are liable to considerable variation in particular cases, depending much upon the health of the child, and upon the general vigour of its nutritive functions. If the ossification be delayed, the flaccid membrane is apt to sink a little below the level of the firm bone around it; and, becoming gradually hardened in that position, a depression for life is the result. If the child be in exuberant health while the bone is being deposited; or if, from change of air, or other circumstance, a sudden impulse be given to the formative powers of the system, the new bone is likely

to be somewhat redundant, and to constitute a decided bump or elevation. But, although man is said to be the creature of circumstance, it is carrying this doctrine a very long way to suppose that the health, or diet, or systemic energy of an infant a year old, will determine the amount of his self-esteem, or veneration, when he attains to years of discretion. The next six organs have their bumps along the upper eyelid, just beneath the eyebrow; a place in which it is difficult to imagine that the shape of the brain can have any bearing upon their prominence or depression. They rest upon nothing but the fat which surrounds the eyeball, and facilitates its movements; or upon the upper part of the cavities of the nose; and are separated from the inner plate of the skull by a considerable quantity of intervening structure. The organ of language is placed in the middle of the eye, where the brain can have no possible connexion with its form, and where this form is liable to be altered by many common occurrences. I do not know whether a great faculty for language is indicated by a projection forward of the eyeball as a whole, or by that convexity of its surface which causes short sight; but it is a well-known fact that the eye sinks into its socket from emaciation, and, also, that short sight is commonly relieved spontaneously in the decline of life. One or other of these conditions, therefore, would either diminish the power of acquiring or using languages, or would expose a phrenologist to serious risk of a mistaken opinion.

The degree in which the shape of the skull may be modified by external circumstances, cannot fail to

produce uncertainty as to the portion of brain (*i. e.* the organ) that is underneath any particular bump. In Mr. Catlin's account of the North American Aborigines, he mentions certain tribes whose foreheads are flattened and pressed away, by the application of mechanical contrivances during infancy; but who, nevertheless, exhibit great ingenuity, and are distinguished by their skill as orators. The heads of these people are all "back," and a phrenologist would probably be puzzled, for a time, as to the exact positions in which Eventuality and its kindred had taken refuge from the "pressure from without." There can be no doubt that among civilized people the same difficulty, in a less degree, would be of frequent occurrence; and that it would be impossible to identify, with any approach to certainty, the portion of brain actually existing beneath a given spot.

Furthermore, leaving external agencies out of the question, there would be no means of proving the identity of the most evident bump. Suppose the existence of an unusually large organ of benevolence, in a brain otherwise below the average size, it would necessarily encroach upon all its neighbours; and might be mistaken for any or for all of them. The liability of every individual organ to vary in size *independently* of its fellows, does away with the idea of general proportion as fixing the position of each. But for this, it might be said that veneration or firmness would be bounded by certain degrees of latitude and longitude, and would be discoverable on dividing the whole surface, of any given head, into a fixed number of equal parts. It is, however, inconceivable that

the increased size of a large organ should be entirely gained in the direction of the greatest resistance; and that, whilst bending the skull outwards, it should not encroach in a lateral direction, by displacing the soft structures which immediately surround it. Such an hypothesis would, however, be required, in order that a phrenological examiner should find his way about the head of the examinee; and (as the organs of very different faculties are said to be immediately contiguous), in order that he should be preserved from the grossest and most fatal blundering.

Perhaps the chief circumstance through which phrenology has been enabled to take hold of the public mind, has been the approach to accuracy with which the most striking peculiarities of individuals have been discovered after tactile examination of their heads. This, however, admits of an easy explanation. For the peculiarities in question always impress themselves upon the voice, manner, countenance, and general conduct; so as to be quite evident to an acute observer, especially if he be a stranger, whose perceptions are not blunted by familiarity. They may be recognized, moreover, instinctively, in the manner constantly done by children; and may produce an almost unconscious expectation as to the bumps that will be found. It is recorded, on good authority, of Dr. Spurzheim (and the story has been told of other persons), that he was deceived by twins, who possessed great personal resemblance, but were essentially different in character. Being first informed of the difference, he was made to examine the same per-

son twice, instead of, as he himself believed, the two in immediate succession; and he gave two widely different accounts, on the same day, of one and the same head, and of his interpretation of the character from its developments. Supposing him to have been honest, which, on the whole, is not unlikely, there can be no doubt that his sensations of touch and sight were modified by expectant attention; and that he felt what he wished to feel, rather than what actually existed. In this way, for the ordinary character drawn up by a phrenologist, a few salient points may always be secured, the rest being composed of vague generalities, applicable to the whole human race, in so far as they are applicable at all. It is by no means sufficiently known, that the points of resemblance between individuals, in regard of character, must always be more numerous and important than the points of diversity; although the latter, having the advantage of contrast, make the strongest impression upon our minds. It is in consequence of the former, that we often perceive so much truth in sketches of character founded upon writing, upon the shape or lines of the hand, or upon other unimportant particulars; people not reflecting that the statements sent to them are by no means of individual application only. And, apart from these universal truisms, it may well be asked what we know of the minds of those around us? of their secret thoughts, or of their real motives? What, without the most earnest self-examination, do we know even of our own? except that our best actions are clouded by much that is earthly and debasing, while those that

seem the worst can seldom be ascribed to a simple desire to do wrong. In all this there is no chaotic struggle between opposing faculties, but a succession and comparison of several ideas; while at the same time there is much to teach us caution in forming, or even in acquiescing in, *any* judgment of another. A man may be bountiful without benevolence; may be avaricious, and yet spend, freely and systematically, for the attainment of some wished-for end; may commit crimes and follies, rather from the undisciplined good, than from the natural evil of his disposition. And with such the phrenologist would be always at fault; either wholly in error, or doubtful of himself, or doubted by the world at large; and unable, from the very nature of the evidence on either side, to reach an assured or satisfactory conclusion. Surely the solemn warning that the judgment of man has been reserved for his Maker, was not intended to be uttered in vain; as it would have been, if phrenology had disclosed the ultimate springs of human action. The advocates of this system have loudly urged the good that would result from its universal adoption; but let them pause, only for a moment, to think also of the harm. It has been ordered by the Almighty Power, and the Eternal Wisdom, that the place of a man, among his fellows, shall be determined by his works; and, if these works were to be prejudged by his cranial development, the very foundations of society would be uprooted and destroyed. The persons in whom the better faculties are, upon the whole, predominant, unable to employ or to confide in their less favoured

brethren, would be compelled either to maintain them in luxury, or to wage against them a war of extermination, in which combativeness and destructiveness would be most formidable adversaries. Prevention being better than cure, an enlightened legislature would require the imprisonment or death of all predestined murderers; and would institute periodical inspections of the heads of children, in order to decide upon their fate. At all events, a large number of the human race would be plunged into a state of *hopeless* degradation; and neither themselves nor their phrenological betters could escape those evil consequences, which such degradation has invariably produced.¹

Before leaving the subject of phrenology, it is necessary to refer to that general relation between the size or form of the head, and the vigour of the intellect, which is commonly supposed to exist. Thus

¹ Readers, who desire to follow phrenology throughout its various windings, and to draw from them an instructive and humiliating lesson, should consult the various writings of Mr. George Combe, especially his 'System of Phrenology,' and his 'Constitution of Man;' the 25th, 44th, and 45th vols. of the 'Edinburgh Review' (especially the 44th, for an essay attributed to the late Lord Jeffrey, and quoted in the text); the 22d vol. of the 'British and Foreign Medical Review,' for an article by Dr. Carpenter; and a work entitled 'Nasology,' by Eden Warwick. The last-mentioned book is a remarkably clever and ingenious production, having for its professed object to demonstrate a reciprocal dependence between the character of a man, and the shape of his nose! but evidently ironical from beginning to end, and intended to show that the extremely vague and loose nature of all such evidence admits of its being applied to one part of the body as well as to another; and prevents it from being conclusive, even though supported by many coincidences, or by an appearance of inherent probability.

it is said that hats of the better qualities, made for the wealthier and more highly educated classes, are, upon an average, decidedly larger than the hats of servants and labourers; and again, nothing is more common than to refer to a high or broad forehead as to an index of enlarged mental capacity. But the exceptions to the rule are too numerous to allow of its unreserved application; there being many instances of unquestionable talent in persons whose heads have fallen below the average, in point of size: while the manner in which form may be altered, by external circumstances, without disturbance of the intellect, forbids the idea of any necessary connection between them. Perhaps the truth may be, that the activity of the brain depends chiefly upon the quantity of its grey substance, and that the quantity may be increased, either by an enlargement of the cavity of the skull, or by increased thickness of the grey structure itself, or by a deepening of the fissures that afford a more extended surface. In this way, a large skull may usually be occupied by an energetic brain; and the spare dimensions of a small one may be more than counterbalanced. It should, however, be remembered, in estimating the capacity of a cranium, that the angle at which its sides approach each other, and its actual length and breadth, are elements far more important than the height of that portion which we ordinarily call forehead; and of which the boundary is defined by the absence of hair.¹

¹ See the mention formerly made of the flattened heads of the North American Indians (page 239). Sir Henry Holland, in his

The view, taken throughout the foregoing pages, that the cerebrum, in the contemplation of every idea, or the issue of every volitional mandate, acts as a single and indivisible organ, although it is supported by a high degree of probability, cannot be maintained as a fact, inasmuch as there are certain circumstances which seem, when considered by themselves, to point to a different conclusion. Of these, it is sufficient to mention that some persons experience a sense of relief, in turning from one kind of intellectual labour to another; as if the part of the brain employed upon the first, were permitted a rest during the prosecution of the second. Such evidence is open to this kind of objection; that, perhaps, the first pursuit was distasteful, and required an active and fatiguing exercise of volition; while the second was agreeable, and engaged the attention automatically. There is much reason to believe and hope, that the obscurities now surrounding this question will soon be removed by the progress of science; and it would be of no advantage to detail them in a volume like the present. The Author has throughout argued upon, or stated, that view of any doubtful question which will, he thinks, hereafter be established; and his readers, if desirous to weigh the evidence, may find

‘Chapters on Mental Physiology,’ denies, chiefly on the authority of Professor Retzius, that there is even a general correspondence between form and intellectual endowments, when the observations are sufficiently comprehensive. Among other instances, Lord Byron may be cited, as remarkable for the small size of his head, insomuch that, in a company of fourteen persons, who made the experiment, there was no one who could put on his hat.

it in the writings to which they have elsewhere been referred.

The phenomena of Mesmerism will next be noticed, not by any means in detail, but simply with a view of referring them to the general principles on which they depend, and of explaining the manner and the conditions of their occurrence.

It is found, when certain persons of excitable nervous temperament are told that they are about to be mesmerised (and especially when they are aided in fixing the consciousness, by being told to direct it upon some object, as the eye of the operator, or a copper disk, or a small coin, and when they are subjected to some process, as an evident means of accomplishing the desired end), that the mental state of *expectant attention*, produces, after a while, either mesmeric sleep, or mesmeric somnambulism. *How* these effects are produced, and by what kind of change, is not known, and probably never will be; but it is known beyond doubt that expectant attention is their immediate cause, that they may be referred to the number of its ordinary consequences, and that there is no evidence to prove, and no necessity to imagine, the agency of any magnetic fluid, or of any emanation from the operator, in order to account for them. Indeed, they may occur without any personal intervention whatever, and in consequence of internal concentration of the thoughts alone.

Mesmeric sleep, or coma, does not present any features of much importance. During its continuance, sensation is altogether abolished, and surgical operations may be painlessly performed. It may be said to

consist of a sort of torpor of the nervous centres, and recovery from it is a question of time, varying in different cases.

Mesmeric somnambulism is the condition in which subjects are commonly placed for the display of their various performances; and it bears a very precise analogy to natural or hysterical somnambulism in all its essential characters. Somnambulism is described by Dr. Carpenter as "an acted dream, the course of which is governed by external impressions," and which is frequently characterised "by a remarkable exaltation of one or more of the senses," and always by "the facility with which the thoughts are directed into any channel, which the observer may desire, by the principle of 'suggestion,' and by the want of power, on the part of the somnambulist, to apply the teachings of ordinary experience to the correction of the erroneous ideas which are made to occupy the mind." From these characters of the somnambulist state, it follows that the person placed in it will be able to feel sensations which are too slight to be perceived in the ordinary waking state; and may thus distinguish, from among many others, by its odour, or its slightly elevated temperature, a coin that had been handled by some individual; or may decipher the address of a letter, or other writing or printing, by tactile examination of the surface. It is also intelligible, the sensorium being actively directed towards the reports furnished by one organ, that these should be received with more readiness, and should form ideas with greater force, than any others. A somnambulist, with bandaged eyes, who was drinking water,

and was told that it was wine, would be nearly certain to acquiesce in the statement, the mind being attentive to the impression received through the hearing, and negligent of that received through the palate. In the natural condition, a person, being accustomed to trust the palate with regard to food and drink, would disregard the intelligence be *heard*; but the two modes of sensation stand, so to speak, upon a natural level; and, when they are opposed to each other, it will be the natural and habitual, or the temporary and artificial, attention, paid to one or other of them, that will determine which shall guide the judgment to its ultimate decision. The keenly aroused attention, say towards the sense of hearing, and the impressibility of the mind with regard to suggestions derived from it, will call up ideas by means of the faintest thread of association, and will cause tones and inflections of the voice, or peculiarities of phraseology, to produce the effect of leading questions, and to determine the nature of a reply. A spectator, asking a somnambulist something that he knows himself, will have his words suggested by the idea present to his own mind; and there is nothing impossible in the supposition that these words may suggest back again the idea that prompted them, and between which, and themselves, there must be some connection. In this way the somnambulist may receive a clue to many things of which he or she had no previous knowledge, and, in the words of Dr. Carpenter, "the love of the marvellous so strongly possessed by many of the witnesses of such exhibitions, prompts them to grasp at and to exaggerate the coin-

cidences in all such performances, and to neglect the failures; and hence reports are given to the public, which, when the real truth is known, prove to have been the results of a series of guesses, the correctness of which is in direct relation to the amount of guidance afforded by the questions themselves."

The rigidity of limbs, and the power to support heavy weights upon them, which usually form parts of mesmeric exhibitions, are often the genuine effects of attention, upon the muscles, and must be classed with the ideo-motor complications of hysteria.

Phreno-Mesmerism, as it has been called, in which the "faculties" of the phrenologist are called into independent action, by touching their respective organs, cannot be displayed unless the subject knows the names and supposed offices of the organs that are played upon. This knowledge has often been fraudulently concealed, by the somnambulist, during the waking state; but when it is *really* wanting, the organs of shaking hands, and of dancing (which do not yet form part of any recognized system) may readily be rendered active by mentioning their names, and by touching the head anywhere. In all cases it is the idea of what is expected, and not the part of the head touched, that governs the course of conduct.

Rapport, or a limitation of the consciousness of the somnambulist to the mesmeric operator, has been shown to depend entirely upon a prior expectation of its occurrence.

The various conditions briefly described above are, all of them, in perfect harmony with the ordinary actions of the nervous system, and range themselves

at once under the laws by which those actions are controlled. In various conditions of health and disease they have long been known to physicians; but, from their rarity, had been little studied or observed, until their artificial production became a familiar fact. Then, unfortunately, they were paraded by ignorant charlatans, in place of being at first deliberately examined by scientific physiologists; and the public mind was thrown into a fever of excitement, concerning matters in which truth and falsehood, honest blundering, and evident fraud, were mingled in unexampled confusion. The phenomena of mesmerism, like all other occurrences in nature, whether vital, chemical, or physical, defy research into their ultimate causes; but the conditions of their occurrence, and the nature of the agencies immediately concerned in producing them, may be regarded as definitively established. And, as there can be no doubt that the mesmeric somnambulism exerts an injurious influence upon its subjects; directly, by encouraging automatic action, and repressing volitional power; indirectly, by exciting the passions and feelings, and by developing a love of the marvellous as a motive to the practice of deception; so it may be hoped that the public will avoid such exhibitions for the future, and will refuse to sanction experiments that are hurtful to the performers; and that conduce, among the audience, only to the gratification of an idle curiosity.

Besides the tricks of somnambulists, mesmerisers have advanced pretensions to a power of "clairvoyance:" pretensions which hold a totally different position from any hitherto mentioned. The "clairvoyant" professes

omniscience with regard to the past and the present, to be able to see all occurrences, wherever happening, and, though uninstructed, to possess the technical knowledge of all arts and sciences, when any such knowledge is required in order to understand the event to which his attention is directed. These foolish and extravagant pretensions have no better foundation than in some attempts to imitate an ingenious conjuring trick; attempts that have always ended in clumsy failure, when subjected to real investigation; and that have been made, generally, by professional swindlers. If the statements of the clairvoyant were true, his powers would be miraculous; and such, of course, ought only to be credited upon testimony sufficiently strong to authenticate a miracle. But in London, within the last few years, these professions have actually been believed; although resting upon no better evidence than that of a few persons of ascertained credulity, or of questionable reputation: and it has been necessary for an eminent physician to act the part of a scientific detective, and to hazard his fame and character by association with the fools and rascals of a clairvoyant *séance*. His thorough-going and masterly exposure has not, however, completely destroyed the delusion; and it is said, even now, that some persons in high places give credit to fictions which render the mediæval miracles respectable by comparison, and cause the tales of the 'Arabian Nights' to appear no longer wonderful. Such believers are perfectly inaccessible to reason; and can only be dealt with in the manner indicated by Hume, who says that those, whom facts cannot instruct, nor

arguments convince, must be left to the guidance of their prejudices.

The class of effects which are produced and described under the term Electro-Biology, differ from, and yet resemble, those of ordinary mesmeric somnambulism. The word "Electro" was applied to them, because they were induced, in the first experiments, by gazing upon a disk of zinc and copper, which was imagined to exert a galvanic influence. Now, however, it is known, that this disk may be replaced by any small object; that it is useful only as a definite something upon which to fix the attention; and that the resulting phenomena may be ascribed, entirely, to the operation of the attentional state upon the mind. The condition of the "subject" appears to be, that the cerebrum is either exclusively or chiefly attentive to the sensations conveyed through the sense of hearing; and, therefore, that either these alone are concerned in the production of ideas; or, if those from other organs do contribute, that they are comparatively disregarded. At the same time, the power of the Will is greatly diminished, or totally suspended; so that the ideas suggested through the ear assume the direction of the conduct. If, therefore, the subject be told something diametrically opposed to facts, and capable of immediate refutation by a mental comparison between the reports of all his senses, he will be deceived; because he is inattentive to the sensations of sight, smell, and taste, and excessively attentive to the sensations produced by sound; which appear to him, at that time, in the nature of overwhelming evidence. The degree in which the will is impaired, and also the

degree of attention to one organ of sense, differs widely in different persons, so that the precise nature of the ultimate result is liable to considerable variations. But, whatever it may be, there is no dominion of the will of one person over that of another; and the influence exerted is entirely by suggestion, resembling, exactly, the ordinary manner in which we strive to convince others, or to modify their actions; and being more effectual, only in consequence of the mental state of the listeners themselves.

Hat- and table-turning, popular amusements a few months ago, are now scarcely practised, and well-nigh forgotten. The steady attention to the idea that the table would turn, was quite sufficient to account for the involuntary movements of the muscles of the arms, and, at the same time, to prevent any consciousness of their occurrence. That these movements took place, and were the direct cause of the rotation, has been abundantly proved by the simple index of Professor Faraday; and, as this index often interferes with the attention of the operators, the same evidence may be obtained still more easily in the following manner. If a smooth and highly-polished table be placed under the hands of operators accustomed to succeed, and it be then secretly rendered immovable, their fingers will be seen to slip upon its surface. Many persons fancied that the force exerted through the tips of the fingers, resting, as they said, very lightly upon the table, would be insufficient to move it in the ordinary way; but, in answer to these objectors it may be urged, first, that the force required is much less than is generally supposed; and, secondly,

that while thinking about the movement of the table, they would necessarily be unaware how firmly they might press upon it, or how much muscular force they might exert. There can be no doubt that when the rotation became rapid, and the party with their table were going round and round the room, every one concerned would push most heartily, and without having the slightest knowledge of it.

The *lifting* of tables must be explained, in so far as it was real, by an alternate pressure upon their opposite sides, causing first one leg, and then another, to be elevated. But the absolute and entire lifting is totally incredible; and, together with the rapping, and all such nonsense, must be unreservedly ascribed to trickery and imposture.¹

¹ The whole subject of Mesmerism, and of all its kindred phenomena, the proportion of truth and error which they contain, their nature, and the method of their production, may be made clear to the apprehension of every one, by careful perusal of the recent works upon the subject. An able article in the 19th vol. of the 'British and Foreign Medical Review,' another in the 7th vol. of the 'British and Foreign Medico-Chirurgical Review,' the chapter on the Functions of the Nervous System, in the 4th edition of Dr. Carpenter's 'Principles of Human Physiology,' the chapters on 'Mental Physiology,' of Sir Henry Holland, the letter of Professor Faraday, in the 'Athenæum' for July 2, 1853, and his recently published lecture on 'Mental Education,' these works, taken together, may be considered completely exhaustive, in so far as the present state of the inquiry is concerned. The brief observations in the text have been chiefly intended to point out that this branch of natural science, although avowedly obscure, is not in any especial manner mysterious or occult; and that its obscurities are likely to be cleared away, not by the platform exhibitions of ignorant itinerants, but by the careful and steady prosecution of scientific research.

PART II.

CHAPTER I.

THE EFFECT OF ILL HEALTH UPON THE NERVOUS SYSTEM.

THE connection between disorders of the nervous system, and ill health affecting the body generally, has more than once received incidental notice in the course of the foregoing pages ; but, notwithstanding this, it is of a nature so important as to require a further and more detailed description.

During the periods of infancy and early childhood, the nervous centres undergo rapid increase in size and in structural development, far outstripping all other parts of the body in the vigour of their growth. The brain is said to double its weight during the first two years after birth ; and almost to attain its maximum by the end of the seventh year. It is evident, therefore, not only that the original character of its structure must greatly depend upon the manner in which the formative processes of the child are carried on ; but also that a defective or feeble organization, then established, would be likely to place its stamp upon

the nervous system for a long period, or even throughout life. For the great principle of nutrition is, that each tissue tends constantly to repair its loss from ordinary usage, by the reproduction of its own kind; and that it can only be raised or improved in character by the long-continued operation of favorable influences. Thus, if a finger be cut, the divided parts are joined again by material of imperfect formation (constituting what is called a cicatrix), and this material is subjected to the same wear, and requires the same constant renewal, as the skin surrounding it; but it is long renewed in its own likeness; and, even if ultimately converted into true skin, the change does not occur until after many years have elapsed. In the same way, if the nutritive materials supplied to the blood be insufficient, during childhood, in quantity or quality, or if the digestive powers be inadequate to their proper application, there is reason to believe, not only that the naturally active growth of the nervous centres will be retarded, but that it will be modified in regard of the kind of new structure that is laid down, and, consequently, in regard of the character that is impressed upon its further development. It is true that the nerves and their centres, under the operation of such injurious influences, do not suffer the same amount of evident physical deterioration that is observed in other structures; but seem, as it were, to be first served from such aliment as is supplied to the blood. The whole nervous system has, indeed, been compared to a parasitic animal; and has been said to grow, and to appropriate nourishment, without reference to the remaining wants of the body.

But there can be no doubt that it suffers, in some degree, from all disorder of the general nutrition; although less affected, perhaps, by an insufficiency of food, than by hurtful alterations in its quality. And, as the aliment actually consumed by man feeds only his blood, while the blood, in its turn, feeds all the structures of the body, it is evident that the growth of the nervous centres may be modified, not by meat and drink alone, but by anything that changes the healthy character of the circulating fluid. Deficient respiration, from a carbonized or otherwise impure atmosphere, and deficient glandular action, from torpor or irregular activity of the nerves of organic life, are both of them the continual causes of such modification; and, therefore, it is only in the perfect systemic balance which constitutes health, and under the operation of salutary external agencies, that the nervous centres of a child can be developed in entire harmony with that normal type which is best fitted to bear the innumerable burdens of animal and of intellectual existence.

The statements that have been made with regard to the *growth* of the nervous system, apply with equal force to that constant renewal which preserves its various parts in their integrity. Like those of all other organs, their individual cells daily perish in the using; and these, for the very maintenance of the fabric, must daily be replaced by the formation of others. Unless this be thoroughly done, a gradually increasing incapacity for exertion will be the result; and it cannot be done, if the health, or the digestive powers, be in any great degree impaired. Hence,

injury to them is so frequently attended by nervous disorder; such as depression of spirits, or confusion of intellect.

In some way, that is not clearly understood, the presence of a due *quantity* of healthy blood is essential to the proper performance of any of the functions of the nervous system. By loss of blood, these functions are temporarily suspended, as in fainting; and, if the blood be altered in its properties, they will be performed in unnatural force or succession, and will be liable to various kinds of disturbance. The effects of alcohol or chloroform illustrate this position in a familiar manner; and the consequences of a gouty or rheumatic taint may be mentioned as further examples of it.

It may be said, therefore, that a continuance of deranged or feeble health in early childhood is likely seriously to interfere with the formation of the nervous system; and hence, not only with its actions at that time, but also with such of them as are prospective. Later in life, disease or constitutional debility will often modify the various forms of nervous activity, and will hinder the efficient repair of the centres; but it is not then so likely to work changes of a permanent character, and the effects may commonly be removed by the removal of their immediate cause.

The nature of these effects may almost be summed up in the single word *irritability*; using it, in the sense given by Mr. Abernethy, to express "debility excited." From the existence of this condition, every stimulus applied to the extremities of nerves, and every idea passing through the brain, would be liable

to produce excessive action, and to be followed by a corresponding period of exhaustion or lethargy: parallel to the hysteric convulsion, on the one hand, and to the stupor which succeeds it, on the other. Weakly infants often show this irritability by the disease known as child-crowing, or *laryngismus*, which consists in a spasmodic closure of the opening of the windpipe, depending upon an impression reflected, through the spinal cord, upon the muscles of the throat; and originating, commonly, in the irritation produced by teething, or by the presence of undigested food. But constitutional debility appears to be, almost, an essential element of this disorder; and healthy children, even though annoyed in other ways by the pressure upon their gums, or by occasional stomach derangement, have not the excitability of the motor system which *laryngismus* indicates. Some infants, as soon as they are evidently conscious with regard to the objects around them, may be observed to have unusual susceptibility to emotional impressions, starting, and being evidently frightened, by sights or sounds that most children of their age would disregard. These, as they become somewhat older, are especially liable to that curious form of infantile hysteria, known as "night terrors." The child will wake up in the night screaming violently; and terribly alarmed at some subjective sensation. If old enough to speak, he will explain the reason of his fright, and will not easily be convinced that it is imaginary, or that it has been completely removed. The nature of the sensation is various; often it is a cat or a dog, often the standard nursery bugbear, whatever that

may be; and, in one very severe and protracted case, the child thought his bed was covered with caterpillars; and persisted in saying that he could see them, and in pointing them out, long after his screams had brought nurse and parents to his assistance.

It can hardly be necessary to mention that such irritability (at a time of life when volitional power is not developed in the same degree as the passions or feelings, and the capacity for movement,) must of necessity tend to subjugate the body to emotions, and the mind to ideas automatically excited; thus paving the way for chorea and for hysteria, and promoting their occurrence when their exciting causes are applied. It follows, that the preservation of bodily health, by judicious regimen, has a most important bearing upon the subject of the present volume; and, therefore, in order to render its plan as complete as possible, I have determined to sketch briefly the leading principles of Physical Education. In the works of many other writers, these principles have been followed out into the details of their application; and such works should be consulted by any reader who finds difficulty in filling up the following outline.

CHAPTER II.

THE PRESERVATION OF HEALTH IN INFANCY AND CHILDHOOD.

THE matters that require attention in the conduct of Physical Education may be included under the several heads of Diet, Temperature, Exercise, and Sleep.

The Diet of young children is of such great importance to their health and welfare, that all who have charge of them should endeavour to learn something of the nature of the requirements that food is intended to supply ; and of the qualities which it must possess in order to supply them properly. Such knowledge, if it could be substituted for a vague notion that this diet is nourishing, or that unwholesome, would prevent an immense deal of infantile disease, and of nursery discomfort ; and would abolish many extraordinary methods of feeding, which now excite the wonder, and require the frequent condemnation, of every medical practitioner.

It has been said already that the wants of the system, and the physical destruction consequent upon every action of existence, are continually supplied by the withdrawal of the appropriate materials from the

blood ; and hence the consumption of food is intended to replace these materials, and to maintain the natural or standard condition of the circulating fluid. It follows, of necessity, that the quantity and quality of aliment should be subject to great variations under different circumstances ; and should be determined with continual reference to the nature and amount of the vital actions, and to the conditions under which they are performed ; these all determining the amount and character of the loss actually sustained by the blood itself, and furnishing, therefore, the only unerring clue to its necessities. In a state of perfect health, the wants of the system are pointed out by the tastes and inclinations, which, when they are genuine, may always be safely followed. But, in all highly civilized communities, these tastes are so habitually disregarded, either through conformity to the habits of society, or through the mere sensuous gratification of the palate, that they cease either to select the good or to give warning against the hurtful ; and the loss of their guidance is too often followed by much derangement of the digestive organs, which, loaded with food in excessive quantity, or impaired by the exhaustion consequent upon the use of stimulants, can scarcely fail to give some token of the maltreatment they are forced to undergo.

The sources of the demand upon the blood occasioned by vital activity, are two in number :—First, to supply materials for the repair of the various structures, for the process of growth, and for the formation of certain of the secretions ; and, secondly, to maintain the temperature of the body.

The repair and growth of the structures may be considered at the same time, as they do but involve different degrees of the same process. By action, the cells of which the tissues have been composed break up, perish, are dissolved, and their *débris* are absorbed into the veins, and carried into the current of the circulation, leaving behind them the germs of new cells, which withdraw from the blood the nutriment they require, grow, are perfected, act, and perish in their turn. The relation of quantity that subsists between reproduction and decay varies in the different epochs of life ; and its variations explain the increase or decrease of the body. In consequence of the increase, the child requires a much larger proportion of food than the adult ; not only to provide for the inconsiderable daily addition to his weight, but chiefly because his structures are more rapidly remodelled, the life of each individual cell is less prolonged, and the claims of its successors are more constant and more urgent. During youth, therefore, the demand for food is not only greater than at any other time, but it is also more imperative, and cannot be disregarded without risk of evil consequences to the health.

The process of secretion so exactly resembles that of nutrition, being, in fact, but the growth of a fluid structure, that no further reference need be made to it. It has been stated, on a former occasion, that some glands withdraw from the blood, not the alimentary materials, but the before-mentioned *débris* of cells that had once existed as nerve tissue or muscle ; and whose injurious accumulation is thus effectually prevented.

The maintenance of the heat of the body is effected by a process of slow combustion, carried on between the oxygen drawn from the atmosphere and the hydrocarbonaceous compounds which find their way into the blood by various channels.¹ The human body

¹ Combustible substances are those which have a very strong affinity for oxygen, and whose combination with it, under favorable circumstances, is attended by an evolution of heat, or of heat and light, and is then denominated combustion. Phosphorus, Sulphur, Hydrogen, and Carbon, are the chief combustible substances, and it is the two latter that furnish the ordinary illustrations of the combustive process; as, when combined in varying proportions, they form the essential part of the materials commonly used for lighting and for fuel. Wood, coal, coal-gas, oil, tallow, and camphine, are all hydro-carbons, and are all burnt in the following manner:—The hydro-carbon, being first brought into contact with the surrounding air, is lighted; that is to say, a substance already burning is brought near to it, upon which the heat develops itself in the form of chemical action, and causes the elements of the combustible substance to arrange themselves into fresh combinations with the oxygen of the atmosphere, the hydrogen forming watery vapour, and the carbon, carbonic acid gas. The force that had been exerted in maintaining the union of the hydrogen and carbon, is liberated during combustion in the forms of heat and light, and these constantly react upon fresh portions of the fuel, either until it is all consumed, or until the oxygen which surrounded it is exhausted. For perfect combustion it is requisite that there should be a certain proportion between the extent of the burning surface, and the rate at which oxygen is supplied to it; for, if the latter fall short of what is necessary, a portion of the carbon will be driven off unchanged, in the form of smoke. A camphine or oil lamp, for instance, will smoke if left uncovered; but a chimney-glass, by occasioning a draught, or swifter current of air, furnishes the flame with sufficient oxygen for this smoke to be consumed.

requires to be maintained at a mean temperature of about 100° (Fahrenheit), and cannot be either raised or depressed, more than a very few degrees, without the supervention of fatal consequences. But, as the temperature of the atmosphere varies from about 130° in the tropical, to about 90° below the freezing point in the polar regions, it is evident that man must be provided, in the functions of his own organism, with both a cooling and a heating process. Of these, the former is supplied by the perspiration, and the exhalation from the skin; the latter by the combustion of materials furnished by the food, and, in some degree, by other sources.

It need hardly be pointed out, that, while the demand upon the blood for the repairs of structure will, in persons leading regular lives, be much the same from day to day; so the demand for the maintenance of temperature will be subject to continual fluctuation and change, in accordance with the changes in the temperature of the surrounding air. For it is evident that the body will have to supply all deficiency, and to remove all excess, the 100° being taken as a standard of comparison. Thus, if the air be at 32° , a man will have to form 68° of heat within himself; if the air be at 68° , he will have to form 32° only; and, if the air be at 110° , his internal heating process will have to be superseded, or at least more than counterbalanced, by cutaneous evaporation.

The formation of the lesser quantities of heat that are required in tropical climates, or in the height of an English summer, may be, almost, or even entirely, effected by the hydro-carbonaceous portion of the cel-

lular *débris* already mentioned. This portion, separated from the rest chiefly by the action of the liver, is applied partly to this, and partly, perhaps, to other purposes; but, whenever a colder external temperature prevails, its effects require to be counteracted by the use of combustible articles of food. What these are, will be stated more fully in the sequel.

When food is taken into the mouth, if liquid, it is swallowed without any delay; but if solid, it is, or rather ought to be, submitted to a process of mastication, by which its structure is crushed and broken down, and it is softened, or pulpified, through intimate mixture with the saliva. By the act of swallowing, it passes into the stomach, from whence its liquid parts are immediately absorbed into the veins; and the more solid, having been subjected to the mechanical action of the stomach itself, and to the chemical action of the gastric juice, the bile, and other secretions formed in aid of digestion, at last are in a state proper to supply the nutriment necessary to the growth of cells; and to form, through their agency, a sort of immature blood, which is gradually carried, by proper vessels, into the general current of the circulation, and blended imperceptibly with the bulk. Oily and fatty matters, however, pass through the process without change, except that of being reduced to particles of extreme minuteness.

The various substances used as food may be arranged, with a few exceptions, into four groups, the Saccharine, the Albuminous, the Oleaginous, and the Gelatinous.

The Saccharine group includes all the forms of sugar,

together with starch, gum, and a great variety of vegetable substances. These are identical, or nearly so, in composition ; and consist of carbon, with oxygen and hydrogen in the proportions to form water. Their destination is to be consumed by the combustive process, for the maintenance of animal heat ; and any excess of them, not required for this purpose, is carried out of the system unchanged. Sugar, arrowroot, sago, tapioca, and such matters, are not nutritious in the sense of contributing to support the animal fabric ; but, by furnishing combustive material, they permit everything that is really nutritious to be applied to the repair and maintenance of the tissues ; and, for this reason, they are, especially for children, very valuable articles of diet. It is worthy of remark, how much the taste for sugar passes away in adult age ; while young people, in whose economy it serves an useful purpose, will generally eat it with avidity. Starchy matters fulfil, also, an important part in the digestive process, by increasing the bulk of the food, and by thus enabling the stomach to act upon it readily.

The Albuminous group is derived both from the animal and the vegetable kingdoms ; and consists of compounds whose chemical constitution resembles that of animal flesh. They are typified by pure albumen, or the white of egg ; and are capable of being converted into all the solid tissues of the body, which thus grow and are nourished by their presence. Lean flesh, curd of milk, and eggs, are the forms in which animal albumen is most frequently consumed ; while, in the vegetable kingdom, it is found most plentifully

in the grain of wheat, or other cereals, and in the seed of the pea and its allies. The albuminous elements of wheat flour may easily be obtained in a separate state, by tying some fresh dough in a piece of muslin, and kneading it with the hand in a stream of water. A firm viscid mass will be left behind, which has received the name of gluten; and this is almost identical with meat, both in chemical composition and in nutritive properties. The part of the flour that is washed away, consists chiefly of starch; and it is upon the different proportions in which the two ingredients are combined, that the different nutritive qualities of grain depend. Wheat, in this respect, has greatly the advantage over all others, the quantity of its gluten being about 18 per cent. upon an average; and, in some samples, amounting to nearly 25 per cent.; while the albuminous matter of rye, barley, and oats, which does not assume precisely the form of gluten, ranges from about 12 to 14 per cent. of the whole bulk of the meal.¹

The Oleaginous materials are well known to be afforded both by plants and animals. They enter into the composition of nervous tissue; are most energetic supporters of animal heat; and, when present in the blood in larger quantities than these demands require, they are either deposited in the tissues in the form of fat, or else are removed from the body by the action of the liver: to which organ they often cause much embarrassment and disorder.

¹ Quoted from M. Payen, 'Précis de Chimie Industrielle,' in Pereira's 'Materia Medica,' 3d edition, vol. 2, part i, p. 967.

People say that "rich things make them bilious," especially in warm weather; and they express, in other words, the simple fact that is explained above. The utility of oleaginous substances in the production of heat is shown by the habitual diet of the Esquimaux, or of other inhabitants of polar regions; and, almost equally, by the disgust which their delicacies excite in the minds of those who live in tropical, or even in temperate, countries. The demands of the nervous system, however, require a certain amount of fat in all climates; and hence some small quantity is always consumed.

The Gelatinous group enters largely into the *composition* of many of the textures of the body, but there is much reason to believe that the substances it includes take no share in the *formation* of these textures; and that gelatinous tissue is produced from the albuminous food, but never, in the body, from gelatine itself. It follows that the "jelly" formed by soups on cooling, affords no test whatever of the amount of nutritive material which they contain.

The juices of fresh vegetables afford matters not included in any of the foregoing groups, but which appear to be almost essential to the health of man; their deprivation being commonly followed by that terrible disease, the sea scurvy, from which, in the days of salt junk, our ships' crews suffered so severely. Now, however, in consequence of a supply of lime-juice, and of a proper knowledge of the importance of vegetables, scurvy is almost unknown among sailors; but it was common among the poor, both in this country and in Ireland, immediately after the

general failure of the potato crop ; and it is sometimes seen to follow the dietetic experiments of invalids, as the result of strict limitation to dry toast and mutton chops.

We may now proceed to consider the plan of diet that is most suitable for children ; and, in doing so, our first attention is claimed by the food proper for infants.

Until the age of four or five months, the stomach of the infant is not fitted to receive, or to digest, any food at all, except the secretion provided by nature for the purpose. Everything else, such as farina, biscuit-powder, or the various patent mixtures of inferior arrowroot with potato starch, is utterly pernicious and abominable, producing acidity, flatulence, pain, emaciation, and every description of disorder. The strong and healthy infants, who do not suffer all this misery after the use of farinaceous food, are those with whom it passes through the body unchanged, and who have had milk administered, with it, sufficient for the supply of their actual wants.

The milk of animals contains an example of each of the three first-mentioned groups of nutritive substances : its casein or curd being albuminous ; its sweetness being due to the presence of sugar ; and its white colour to the fatty matters which form its cream. The casein may be said to supply the material for growth ; the cream the oleaginous constituent required for the rapid increase of the nervous system, and a residue, which, together with the sugar, is burnt off for the maintenance of heat.

The emotions consequent upon the cares of civi-

lized life, and the general disorder of secretion consequent upon impaired health or debility, often combine to prejudice the health of the sucking infant by their influence upon the quantity and quality of its food. Whenever this is the case, whenever the child is thin, and puny, and fretful, and suffers from evident disorder of the stomach, then its food should be changed, and the source of the evil removed.

The human infant, destined to be almost quiescent during the first few months of its life, has not much demand for casein, until it begins to display bodily activity; and, consequently, the supply provided for it gradually increases, both absolutely, and in proportion to the other constituents of the milk. The increase of activity, and the increase of casein, involve a corresponding destruction of the cells of the body, and an increase of the combustible materials supplied to the blood from within; so that the sugar and fat of the milk are not so much required, and they diminish in proportion accordingly. But the young of the lower animals (a calf, for example), is born with locomotive powers equal or superior to those of a human infant at a year old; and requires at once a milk of suitable composition, containing an abundance of casein, and only so much of the heat-producing elements as will supply the remaining deficiency, after the considerable waste of the body has been consumed. It follows that the milk of the cow, although admirably adapted for children of a year or more, is not fitted to supply the constitutional requirements of early infancy, until it has been modified in composition by proper addition and dilution. For this

purpose, the milk selected should throw up an abundance of cream; and should be diluted with its own measure of water during the first week of the infant's life: a lump of sugar, of the size of a nutmeg, being added to each half-pint of the result. The quantity of water should be gradually diminished, until, at the end of the second month, it does not exceed one part, to four of new milk. Upon this the infant should be kept to the end of the sixth month; when the greater vigour of its movements may justify an addition to the albuminous elements of its food. For this purpose the finest wheat flour should be added to the milk and water, being first carefully and smoothly stirred with a portion, and then gently heated, until it thickens,¹ with the whole. About a teaspoonful of flour will be required for each meal; and the quantity of liquid given may always be determined by the appetite of the infant. But it is essential to observe the greatest regularity with regard to the periods of feeding, never allowing the interval to be less than two hours, and, at first, not extending it beyond three, unless when the infant is asleep. When the four front teeth have made their appearance, a sponge biscuit may be given about once in twelve hours; and, at the eighth or tenth month, animal food becomes admissible. Beef tea is, perhaps, the most suitable, a

¹ The *thickening* of the milk when the flour is boiled in it depends entirely upon the starch which the flour contains; and would be equally produced by the use of pure starch, such as arrowroot, or tous-les-mois. But these things contain no gluten, and are infinitely inferior to the flour in point of their nutritive qualities.

little starch being added to it in the form of arrow-root, and the milk being replaced by it on alternate days.¹

¹ The author is perfectly convinced, from many trials, and after considerable opportunities of observation, that the plan of diet mentioned in the text will preserve an infant in the highest attainable state of health, with absolute certainty; and that any deviation from it will, at least, reduce this certainty to probability by supplying food against which the digestive organs of *some* children will rebel, although others may be able to tolerate it. He supposes, of course, that other injurious influences, such as cold, humidity, infection, &c., are strictly excluded, and he would then say that careful feeding by hand is always preferable beyond comparison to the employment of a hired wet nurse, and generally preferable (in so far as the welfare of the child is alone concerned), to maternal suckling. For, in the ordinary conditions of existence, the human mother is subject to variations in diet, in health, and in equanimity, all of which alter, even if they do not absolutely prejudice, the character of the nourishment that she affords, and produce indigestion in the infant, from the unaccustomed quality of its food. From these variations the cow is almost exempt, and the composition of her milk is far more certain. But the horrible trash that is given to some children, and especially to those brought up by hand, renders it impossible for them to be healthy; and the author cannot advocate dry-nursing, unless it be done in strict obedience to his directions. In following these, however, there is one source of disorder which often embarrassed him, until he discovered its cause. This arises from the circumstance that milk rapidly becomes sour, and that the slightest trace of yesterday's meal will communicate, even to the freshest, a disposition to ferment; while the wood, cork, bone, leather, or other porous materials that enter into the composition of the common feeding bottles, absorb and retain liquid, and speedily acquire an acid quality and smell, so as to need spirit for their thorough purification, and to engender, unless purified, a disposition to acidity in all the food that is put into them. This difficulty is completely obviated

As the set of teeth becomes gradually perfected, the child's liquid food should be replaced by solids; and he should be taught to masticate carefully, thus laying the foundation of a good habit, that will stand him in stead in after life.¹ Bearing in mind the destination and object of each article of food, as known by the class to which it belongs, the diet should be apportioned to meet the fluctuation of the several demands. Thus meat and wheaten bread, useful to build up the structure of the body, will be chiefly required in consequence of active physical exertion. Oleaginous and farinaceous matters, necessary for the maintenance of heat, should be given in increased quantities under a cold external temperature. At all times there should be a portion of fresh vegetable; the succulent kinds, and *ripe* fruit, being admissible and beneficial in their respective seasons. More than this it would be difficult to say, inasmuch as all general rules require to be applied with discrimination to the cases of individuals, and to the varying circumstances that continually present themselves in life.

It may not be amiss, before leaving the subject of diet, to say a few words on Vegetarianism; that practice having gained many adherents during the last few

by the excellent and ingenious feeding bottle lately invented by Mr. Bucklee, of New Bond Street, every part of which is either of glass or silver, and presents an unabsorbent surface, that may be perfectly cleaned by the use of hot water only.

¹ There is much reason to believe that the increasing longevity of the better classes is greatly due to the improvements in the art of dentistry.

years. Remembering that all the animals whose flesh is commonly used for food, have formed that flesh by the digestion of vegetable substances, there does not seem any reason why man should be unable to do the same. But the use of animal flesh, as compared with that of vegetable albumen, may be regarded as a saving of trouble to the digestive organs ; the former requiring little more than mere solution, and the latter, a chemical process, in order to prepare it for admixture with the blood. Hence, the animals that are exclusively carnivorous have a very small and simple stomach ; and those that are exclusively herbivorous, have four stomachs of complicated construction. The stomach of man approaches more nearly to the carnivorous type than to the herbivorous ; and, although it is capable of digesting either kind of food, a diet exclusively vegetable seems to be an unfair and excessive tax upon its powers. But the human race, although able to subsist upon vegetables alone, cannot maintain life upon an exclusively animal diet, except under a high external temperature, and with the aid of active bodily exertion. Moreover, it is stated by Dr. Carpenter, that vegetarianism interferes more with intellectual than with physical strength ; and it may be inferred from these several considerations that the mixed diet in common use, varied in the proportions of its different elements in accordance with the principles stated above, will be found not only the most agreeable, but also the most wholesome. The beneficial moral influence that is ascribed to a vegetable regimen by its advocates, may be at once dismissed as simple nonsense, having no foundation but in the

imagination of those who talk of it, and totally contradicted by all the facts of the case.¹

Whatever the nature of the food, it is found by experience that its agreeable flavour, and the relish with which it is eaten, greatly promote all the processes of digestion. To develop flavour, to increase relish, and moreover to introduce an indispensable ingredient into the blood, man, and all other animals, are led instinctively to the use of salt, by which these purposes are fulfilled; and without which, food would scarcely be palatable, and would often be rejected by the stomach. The utility of salt, and the connexion between appetite and digestion, may serve to teach one important lesson with regard to the diet of the young: namely, that they should never, under any circumstances, be compelled to partake of food, when inclination leads them to avoid it. Coercion of this sort is practised by some parents, in punishment of supposed daintiness, or with the idea of preventing waste; and their children are forced to swallow what is not only distasteful to their palates, but also, at that time, positively unwholesome, either by being excessive in quantity, or of a kind for which there is no demand in the system. A little reflection would shew that there can be no greater waste than in eating more than is wanted; and, if the alternative be abstinence, a fastidious taste is not likely to interfere, in any material degree, with the meals of healthy children.

The quantity of food required for the maintenance

¹ See the Articles on Vegetarianism. 'Brit. and For. Med.-Chi. Review.'

of health varies so much in different individuals, that it would be impossible to lay down any precise rule with regard to it. But, in the generality of cases, appetite is a guide that may be safely followed, so far as plain food is concerned; although, when dainties are in question, it may sometimes be artificially excited, and may thus become deceptive. Infants, if they take too much into the stomach, generally reject a portion; and hence, the quantity that is best for them, may speedily be learned by observation. Older children, if at any time suspected of wishing to eat too much, or of letting the pleasures of the palate carry them over the boundaries of veritable appetite, may be offered the plainest food, even dry bread, as a test; and, if they eat it, they are tolerably sure not to take more than is for their good. It must be remembered that children always require a considerable amount of alimentary material; and, with wholesome things, it would usually be better to err by excess, than to do so upon the side of deficiency.

The intervals between children's meals should not be prolonged; and, above all things, should not be irregular. They soon droop, if permitted to remain fasting; and their digestive organs, like those of their elders, are in the greatest activity at accustomed times of exertion. Hence, when old enough to sleep all night without food, they should still have a little bread, or bread and milk, immediately upon awaking; and they should be strictly kept to their accustomed hours, and not permitted to have late dinners as a treat. But, although long fasting is hurtful, the undue crowding together of meals is at least equally so; inasmuch

as the earlier and the later parts of the digestive process cannot be thoroughly performed at the same time; and, if fresh food be swallowed while the stomach is still occupied upon that which was taken before, neither the new nor the old can be properly disposed of. There is, indeed, no more common cause of juvenile disorder than the continual stuffing between meals which some parents ignorantly or carelessly permit; and young infants, often fed whenever they cry, are the most frequent sufferers. Reasonable intervals, and regular meals, are great desiderata in the dietetic management of children; and it should constantly be borne in mind that a certain quantity and variety of food is essential to the perfect health and the proper development of the body; and may be called, in the strictest sense, a necessary of life. It follows that this quantity and variety should never be interfered with for purposes of punishment; except, perhaps, by the withholding of mere delicacies. Anything beyond this must be condemned as an injudicious proceeding, of which the probable mischief would far outweigh the utmost possible good; not only on account of the palpable departure from the dictates of a sound physiology, but because it is plainly desirable to chastise, or reward, through feelings of a higher order than the merely sensuous gratifications of the palate. Whatever indulgence is withheld after misconduct, and is associated with praise in the possession, cannot fail to be highly valued by the child; and there are many sources of pleasure which should thus be treated, in preference to a purely animal enjoyment.

The question of Drink requires very few words for its discussion, inasmuch as all fermented liquids should be withheld from children, except under medical advice. Milk, and water, are, therefore, the only remaining ones, and both must be made useful; although the first, except when much diluted, is rather a fluid food than a drink, being speedily curdled in the stomach, and depositing a substance that requires digestion. For this reason, milk should not be given cold, because a sudden reduction of temperature would seriously retard the digestive process. About water itself very little need be said. The common practice of flavouring it with toast, if not very commendable, is at least harmless, and a matter of taste. Filtration will most frequently be advisable, especially for the dwellers in towns; but the boiling that is often recommended for the destruction of imaginary animalcules, never need be practised: its principal effect being to expel the carbonic acid gas, from which spring water derives its pleasant freshness. When the body is rapidly cooling after exercise, or when digestion is being carried on, very cold water should not be taken, or should only be taken sparingly; but at other times there are scarcely any restrictions that need be insisted upon, the tastes and inclinations affording a sufficient guidance. Tea and coffee, stimulating narcotics, should be entirely forbidden to children, at least until the second teething is completed; and even then, should only be given in very small quantities. The "cheering" action of these substances is supposed to depend upon a retardation, through their influence, of that waste of the

body which is the natural consequence of its use, and the continual cause of its repair. Such a retardation, if produced in children, could not fail to be highly injurious to them; as their tissues decay and change more quickly than those of the adult: the *débris* both requiring more speedy removal from the body; and being sooner hurtful, when unduly retained.

Next in importance to diet, and nearly connected with it, is the necessity for a proper degree of temperature; a subject upon which, it is to be feared, there is great want of knowledge among the public.

In order to place it in a proper light, it may be desirable to repeat, that the constant maintenance of a high degree of temperature (about 100° Fahr.) is absolutely necessary to the continuance of life, and is one of the essential conditions of vital activity. A finger, or other small portion of the body, remote from the central organs, may be benumbed for a time without injury; but, if the whole body be exposed to cold which it cannot overpower, a remarkable depression of every energy is produced, the circulation sinks, drowsiness steals on, and sleep, terminating in death, is the result. The proper temperature is maintained by the combustion of certain heat-producing materials in the blood; and, when a high degree is required, warm clothing is used as an auxiliary: the rationale of its employment being that it is a bad conductor of heat, and hinders it from being carried away by the atmosphere. Exercise, by quickening the circulation, promotes the combustive process, and tends to raise the temperature of the body; but it can only do this so long as the blood is sufficiently supplied with combustible matter; and,

when the supply is exhausted, the worst effects of cold are produced. Hence, persons who die from starvation, die, in fact, from cold; and, as a general rule, the maintenance of heat is first provided for from the blood, and only the superfluity of the aliment can be applied to the repair or increase of the body.

A moderate degree of cold, such, for instance, as that of a common plunge-bath, excites, in healthy persons, a marked effort to generate more heat. The breathing is immediately quickened, so as to supply an increase of oxygen to the blood, which, in its turn, is driven more rapidly through the lungs and other organs by the accelerated action of the heart. The result is the state of *reaction* or *glow*, which may be described as a sudden and general exaltation of the vital activity of the body; and which, continuing for a longer or shorter period, exerts an invigorating influence upon all its parts and functions. Reaction, however, cannot properly be called an *effect* of cold, but rather a successful effort to resist it: the cold, by the stimulus of necessity, calling forth the vital force that might otherwise have remained dormant. This distinction is not sufficiently appreciated in practice; and many persons suppose the cold itself to be a tonic agent: a mistake that leads to much error in the management of children. It cannot be too thoroughly understood, that a low temperature is just an emergency that has to be provided for; and that, when it is not excessive, it calls forth vital force for the occasion, although often in greater amount than the occasion would absolutely demand.

When the cold is greater than the heat-forming

power opposed to it, the effort which constitutes reaction cannot be made ; and the resulting depression varies, in its amount and consequences, with the degree in which the temperature is lowered, and with the time during which the cold has been applied. After prolonged bathing, when the body has been *gradually* chilled by immersion in a fluid cooler than itself, the symptoms depend upon derangement of internal organs, rather than upon any affection of the surface ; the respiration and circulation being impeded, and thus, the skin becoming dusky, the pulse feeble, and the whole tone of the system being reduced. The more sudden effects of very severe cold are produced upon the parts immediately exposed to it, and especially upon those most remote from the heart. Even in an English winter, the fingers and toes are pinched and benumbed ; and in Canada, on the rare occasions when an intense frost is accompanied by wind, any portion of skin left uncovered is blistered and destroyed, as if touched by a red-hot iron. Generally speaking, the effect of undue cold is to produce so great a demand upon the blood, for the maintenance of the necessary temperature, that the albuminous elements of the food are diverted from their proper destination, in order to fulfil this purpose ; and thus the growth of the body is diminished : the inhabitants of polar regions, for instance, being universally of dwarfish stature. Parts or organs which are more exposed than the rest, suffer in a strictly analogous manner,—their vitality being lowered, their proper size not being attained, and the quality of the tissues entering into their composition being deteriorated ; so

that they are prepared, as it were, to become the seats of diseased action, and are weakened in their capacities for resisting any noxious influence that may be brought to bear upon them.

Although the foregoing observations apply, more or less, to the whole time of growth, yet, as childhood passes into youth, the power to resist cold greatly increases: the active habits, the good appetite, and the sound and speedy digestion, of this and the next period of life, all greatly promoting the formation of abundant animal heat. Hence, it is common to hear parents recommending active exercise as an unfailing remedy against the pain of being cold. To a certain extent they are right; but with the important reservation that a child, who does not consume an adequate quantity of heat-producing food, can no more keep warm by exercise than a fire can burn without fuel. And this food is required, of course, to be in actual circulation at the time; so that, after sleep or fasting, the only effect of exercise in the cold would be to cause an excessive demand upon the albuminous elements of the blood, or even upon the tissues of the body: occasioning their wasteful decomposition, in order that the portion of hydrocarbon which they contain may be burnt off for the maintenance of heat; and adding fatigue, and general exhaustion, to that low temperature which was the original evil. It should be remembered, moreover, that to permit the escape of heat by insufficient clothing is to cause a direct demand for its formation in larger quantity; and that this practice, bad economy even when abundance of food is taken and digested, must be condemned as

equally cruel and injurious, under any less favorable circumstances.

In infancy and early childhood,—partly from the character of the diet, partly because the vital energies are almost entirely expended in the production of rapid growth,—the power to generate heat is very trifling; and a moderate degree of cold will exert a noxious, or even a fatal influence. It follows, that young infants scarcely can be kept too warm, or be guarded too sedulously from sudden changes of temperature. Even if they have the constitutional strength necessary for reaction, cold must always interrupt and delay their formative processes, must retard their growth, and check the progress of their general development. They should, therefore, be carefully and thoroughly wrapped in flannel, and should be kept in a warm atmosphere, screened from accidental currents of air.

For children of all ages, it is important that, in cold weather, they should be properly clothed, over chest, neck, legs, and arms, with close-fitting flannel or woollen garments; that they should have an abundant supply of oleaginous or starchy food; and that, when within doors, they should inhabit a room of uniform and comfortable warmth. The last-mentioned precaution is often shamefully neglected in inferior boarding-schools, and is seldom properly attended to even in those of a better class; either the parsimony of the principal, or an unnatural desire for cheapness on the part of the parent, placing an obstacle in the way. But care in this matter should be made an essential point in the selection of an educational establishment, more particularly in the case of girls; and the school-

mistress in whose house chilblains are of common occurrence, should be regarded as either ignorant or negligent of her most important duties: *most* important, because it is hopeless to attempt the cultivation of the mind, unless, at the same time, care be taken to promote the health and development of the body. Generally, on all points connected with temperature, it would be impossible to urge too strongly the observation of a late distinguished physician, who said, that more children perished annually from attempts to harden them, than from the combined fatality of disease and famine.

In respect of clothing, there is one prevailing error greatly to be deprecated, and sufficiently common to demand an especial notice,—namely, that which induces so many people to send out their children with unhappy little bare legs. Apart from the enfeebling operation of cold upon any exposed limb, and its certain effect in producing a stunted growth and diminished vigour, the knee-joint is especially prone to suffer from its influence; and is, of all parts, perhaps excepting the chest, the one that should be most thoroughly protected. The hurtfulness of allowing wet clothes to dry upon the body, and the propriety of changing them as soon as possible, are matters of familiar knowledge that need not here be insisted upon; but it is not so generally known that this hurtfulness depends, chiefly, if not entirely, upon the abstraction of animal heat caused by the drying process. The evils arising from damp shoes, damp clothing, damp beds, etc., may be referred at once to their refrigerating operation; and to remember this

will greatly facilitate the acquirement of right ideas on the subject of temperature, as well as the practice of the several precautions which such ideas will suggest.

At night, when the atmosphere is colder than in the daytime, and when the vital resistance is diminished during sleep, the preservation of heat should receive careful attention, and should be ensured by a sufficient supply of coverings to the bed.

Neither at night nor by day, however, must warmth be obtained at a sacrifice of the purity of the air. If ventilation be impeded, the combustive process is checked, and the temperature of the body decreased, by the diminished supply of oxygen; so that, even in point of warmth, little real advantage is obtained. On the other hand, the retention in the blood of carbonaceous and other impurities, reacts injuriously upon the whole system, and operates both as a predisposing and an exciting cause of disease.¹

¹ When making statements similar to those of the above section, the author has frequently been met by objections, from patients and others, founded upon the strength and hardihood of the Highlanders of Scotland, and upon the presumed healthiness of the exposed and untended children of the labouring agricultural population. In reply to them it may be said that the purity of rural air, its larger proportion of oxygen, and, as recently shown, the greater absolute chemical activity of that substance, are all conditions eminently favorable to the development of animal heat; and sufficient to establish a great difference between town and country children, in point of resisting power: the suburban districts, whose atmosphere has frequently passed over the adjacent town, being always classed with it in this respect. This difference would, however, apply alike to all ranks of the population; but the children of the poor, when out of doors, have this advantage—

The great importance and value of active bodily exertion as a means of physical education, is so generally appreciated by the public, that it can only be necessary, in a treatise like the present, to mention the chief purposes which exercise will fulfil; and the manner in which it may be practised to the greatest advantage.

With regard to the whole body, the effect of exercise is to quicken the respiratory movements and the action of the heart; so that the blood is more thoroughly purified by the air, and is made to pass more rapidly through every individual organ: each one being

namely, that there is little contrast between the temperature of the air, and that of their imperfect dwellings; so that the external cold is not a sudden shock to them, as it is to the inhabitants of a well-built nursery. The former, therefore, are inured to a tolerably constant degree of cold; the latter are exposed to abrupt variations. The former have a diet adapted to their habits of life; and easily digest large quantities of coarse farinaceous food: the regimen of the latter harmonizes with the other comforts they enjoy; and does not prepare them for the occasional trials of that, so called, hardening system, which, while it gives the dietetic and domestic advantages of wealth, strives to obtain, by scanty clothing and low temperature, the benefits incidental to the constant exposure of the poor. Moreover, among the peasantry, a real hardening process has been carried on for successive generations; so that, like the natives of the several zones, they are acclimatized to the circumstances of their condition; although, even with this in their favour, it is only the naturally robust among their offspring who thrive under real hardship. The others pass unnoted by the casual observer, who sees ruddy children playing at a cottage door; and is not told of those that are gone to an early grave; or of the poor little starveling, the sickly one, that is so often to be found within.

flushed, so to speak, and relieved of many impurities that would be permitted to accumulate by a languid circulation. Hence, there is a certain waste or consumption of all the tissues; and, during the repose subsequent to exertion, this should be made good by the formative processes. It follows that, when exercise is taken, the blood should be well charged with nutritive material; that excessive fatigue should be avoided, as leaving little energy to direct the application of this material to its purpose; and that active movements are incompatible with the proper performance of any function which requires a concentration of blood, or of nervous force, upon its particular organ during its continuance.

Upon the muscular system, the effect of exercise in causing waste and repair is more remarkable than any other; but it has also a farther, and equally important operation, in rendering the muscles either habitually subservient to the will, or habitually independent of it, according as the actions performed are objectless or the reverse.

From the above considerations certain general rules may be deduced, which, in the regulation of exercise, it is very desirable to remember and observe. They are :

First, active exertion should never intervene between sleep and food; that is, it should never be practised before breakfast. During sleep the repair of the body has been constantly going on; and it is probable that the blood would require a fresh supply of aliment before being in a fit state to recommence that process.

Next, when food has been taken, exercise should be suspended for awhile, in order that it may not interfere with the performance of digestion. While this is being accomplished, there is considerable determination of blood to the stomach; which blood would be drawn into other channels by abrupt bodily activity. The feelings furnish a sufficient guide as to the length of rest that is desirable; and, for children, a very little will suffice.

Thirdly, exercise should never be such as to produce exhaustion; but should always terminate at the point of fatigue. If it be carried farther, the depressed nervous force may be insufficient for the repair of the tissues; and then a diminution, rather than an increase of strength, will be the unavoidable result.

Lastly, the preference should be given to all those modes of exercise which engage the volition in the performance of a definite act; and which, by habit and practice, increase the control of the will over the voluntary muscles. This effect of determinate movements has not received the notice which is its due; for, in reference to hysterical and other emotional convulsions, it would be difficult to exaggerate its importance. It is chiefly in the case of girls (in whom such disorders occur most frequently) that special attention is required for the proper development of this influence; because, although it is exerted, in an equal degree, upon boys, their accustomed sports are, generally, of a kind calculated to produce it. For this purpose, however, walking is the least useful of all exercises, because it is constantly performed automatically, and need not engage the

thoughts in the slightest degree. Yet how many girls at school have no other exercise than a promenade in couples; while some mistresses permit, or even enjoin, the practice of reading during the walk; and, as if to diminish in every way its possible benefits, go always in the same direction, and to the same distance. Children, whose voluntary muscles are thus surrendered to the habitual direction of the inferior nervous centres, cannot be expected to retain, in any proper degree, the power of the will over them; and accordingly they are often found to be utterly deficient in bodily self command: starting or screaming at any sudden sight or sound; governed by the slightest emotion of terror or surprise; and, in the *motives* of their conduct, approximating to the type of the lower animals, rather than to that of humanity. Moreover, such exercise as they do take, from its languid and unenjoyable character, is seldom sufficient to produce a high tone of bodily nutrition; and thus they are prepared, both physically and morally, to swell the number of those who fall victims to hysterical disease.

The way to avoid all this, is to give the preference to those modes of exercise which aim at a definite object; and which require the attention of the mind to direct the activity of the body. Variety is a matter of some importance; inasmuch as the same thing constantly repeated will soon become a consensual action; and competition is highly desirable, as insuring the maintenance of attention. It is worthy of remark how thoroughly these conditions are fulfilled in the ordinary games of boys; and how imperfectly in those

of girls ; although the latter have admirable resources in battledore and shuttlecock, *jeu de grâce*, and archery. Among the best of the more active exercises, suitable for boys, fencing and single-stick hold a prominent place ; and should never be neglected where it is possible to practise them. Generally speaking, such as bear any analogy to these are very much more useful than such as have no determinate purpose ; but which involve only the mere running, and jumping, that might be performed spontaneously from exuberance of spirits.

Next after exercise, in a natural sequence, follow the considerations connected with Repose and Sleep : those important conditions of the system through whose agency the wearied and exhausted organs are restored to their pristine vigour.

The necessity of repose, for the repair of the body, may be inferred from the statements that have been made as to the impossibility of carrying on two important processes at the same time ; and the state of sleep appears to be simply a provision for insuring complete inactivity, both corporeal and mental, while the nutritive functions are being performed with undivided energy. Sleep is, therefore, an affection of the cerebro-spinal nervous centres, by which their powers are suspended : in order, as may be supposed, to concentrate the whole of the nervous force upon the operations of the sympathetic system. To enable sleep thoroughly to fulfil its destined purposes, there should be a sufficiency of alimentary material, in the blood, to restore every part of the body to its normal condition ; and the sleeper should not be aroused

before this restoration is effected. Hence, children should be suffered to sleep as long as they will; although not to lie in bed when once awake: and their slumbers should be guarded, as much as possible, from all circumstances likely to disturb them. It is important, also, to keep to their accustomed hours of rest; and not to break in upon these by evening amusements of an exciting character, or by indulgences foreign to their ordinary habits, and likely to interfere, by the production of dreams, with the perfect repose of the brain. Beyond this, there is little of practical importance to be said; and an account of the mode in which sleep is produced, or of the phenomena presented by its several gradations and varieties, although affording a tempting opportunity for digression, would be irrelevant to the subject matter of these pages.

The restlessness of many children before they sleep, or before their first light sleep passes into profound slumber, often displaces the coverings of the bed, and leaves them exposed to cold. This should be remedied by covering them again when asleep; or by giving them, if very restless, a long night dress of flannel, from which some degree of protection may always be obtained. Care should be taken to prevent the head from sinking deeply into the pillow, as its covering of hair shields it from cold; and, if unduly heated, blood is attracted to it in excessive quantity, and diseased action is not unfrequently the result.

When children rest from exertion during the daytime, without attempting to sleep, they should always be permitted to rest completely; and should not be

required to sit upon stools, or straight-backed chairs ; but suffered to lean in any direction that inclination dictates. In this way, the muscles that are most fatigued will be relieved from all exertion ; and those only that are prepared for it will be called into activity. The barbarous custom of denying comfortable support to the backs of growing children, and of calling upon them to "sit up" when their shoulders sink down from fatigue, has been followed, like every other violation of the order of nature, by the most calamitous consequences to the unhappy victims. Of the girls thus treated, there is probably not one in a hundred who escapes spinal distortion ; and a large proportion suffer from it in an extreme degree ; but, notwithstanding this established fact, persons are still found sufficiently ignorant or prejudiced to persevere in the abominable system ; and to combine, in their methods of education, nearly every possible physical and moral evil. Let it be hoped that the day is not far distant, when a more extended knowledge of the laws of life and health will lead to improvement in this and many other respects ; and will compel the abandonment of many practices which would be unanimously condemned and scouted, even now, if their adoption were proposed for the first time.

The only means, however, through which so desirable a reformation can be brought about, will be the right employment of the advantages of education, so as to counteract and dispel the superstitions of the vulgar. It happens now, in far too many instances, that timidity, or want of knowledge, on the part of the

mother, commits the virtual control of the nursery to an ignorant woman, whose traditions, if sometimes based upon fact, are often the expressions of prejudice or error ; and whose self-sufficiency is never disturbed by a doubt of her own capabilities. But it is the plain duty of all parents, whose position affords them the opportunity, to acquaint themselves, in some degree, with the conditions that control or modify both mental and bodily development ; so that they may be able to assign a reason for every practice that they permit ; and may know, on all matters connected with the preservation of health, what rules to follow, and what things to avoid.

PART III.

INTRODUCTION.

THE reader, who has given his attention to the subjects treated of in the first division of this volume, and has followed the description of the offices, the moving powers, and the disorders, of the nervous system, will have little difficulty in understanding that a proper cultivation of the intellect, and a rational control over the passions, while important in all the relations that man bears to his fellow, are at least equally so, in their effects upon the health of the individual. He will readily admit the advantage of governing those ideas which, when unbridled, hurry the mind beyond the boundaries of reason, or in directions opposed to the dictates of experience; and of restraining those passions which, in their greatest violence, degrade the physical organism to be their puppet and their slave. But, if himself accustomed to yield to the exuberance of fancy, rather than to strive after the concentration of thought; or to act in conformity

with impulse, rather than to pause for the guidance of reflection; it is likely that he may disbelieve the very existence of a sway which he cannot exercise; and the possibility of enforcing a discipline to which he is unable to submit. Such disbelief may be heard from the lips, or recognized in the conduct, of all those persons who speak of temperament as an excuse for moral transgressions; and who regard temper as a master to be obeyed, rather than as a rebel to be overcome. They may, perhaps, think correctly, or nearly so, with reference to themselves, or to others who have grown up like them; but they will be under grievous error, if they measure by their own standard the ideational and moral educability of the human race; or estimate the degree of self-control that is attainable through industry, by the negative results of their own heedless self-indulgence. It is probable that a capacity for the *highest* achievements of volitional power, whether in determining the succession of the thoughts, or in subduing the fierceness of the passions, should be regarded as the especial prerogative of a few extraordinary minds. But, nevertheless, a self-command, greater than is commonly exercised in the world, might undoubtedly be acquired by the majority of mankind; and the author is convinced that its acquisition might almost be insured, by proper domestic training in early life. It is, therefore, his object to demonstrate the principles on which this training should be founded; and to show how the thoughts and the feelings may be subjected to the will of the person in whose brain they have arisen.

For this purpose, the principal questions connected with Moral Education will be discussed in three chapters: of which, the first will be devoted to the Ideas and Volitions; the second, to the Passions and Feelings; and the last, to the consideration of various Studies and accomplishments, and of the methods in which they may severally be rendered useful, in promoting the attainment of the end that is held in view. Of these chapters, each one might easily be enlarged, so as to exceed in bulk the whole of the present treatise; and yet without any transgression of its natural and proper limits. But an endeavour has been made to condense their subject-matter as much as possible; and to present the most important principles of education in the form of an outline, to be filled up by the intelligence and observation of the reader. Without the exercise of these faculties, no precepts can be successfully carried into practice; and hence, no harm can arise from the omission of details which these faculties are clearly able to supply. Moreover, the diversity between different children is so great, and the varieties of temper, of talent, and of disposition, combine in such fluctuating proportions for the formation of character, that the general rules of education can alone be safely dealt with; and their application must always rest with those who can watch their daily consequences, and can perceive the nature and tendency of the influence which they exert. It is evident that, in relation to health, the government of ideas is most important to the male sex, whose nervous diseases are chiefly intellectual; and the

government of the passions to the female, whose nervous diseases are chiefly emotional. But no exact line of demarcation can be drawn between opposites that fade into each other; and it is sufficient to mention their occasional distinctness, leaving their discrimination to be accomplished by the reader.

CHAPTER I.

THE REGULATION OF THE IDEAS AND VOLITIONS.

IN describing the relations between the brain and the inferior centres of nervous activity, it was necessary to give some account of the origin of Ideas, and of the influence of association in causing their recall. This account, however, was intended to illustrate the mode of action peculiar to the brain, rather than the ideas themselves, which are the fruits or results of its operations; and, in the present chapter, it will be proper to pursue a different course. The attention of the reader will, therefore, be directed to the process of ideation, apart from all notice of its material organ; and to the conditions, and the control, of the associative tendency, apart from all considerations of physical change.

Commencing with the *formation* of ideas, it will be remembered that they arise, in the mind of a child, as interpretations, so to speak, of its feelings. A *simple* idea, when first excited, is a perception of the nature or immediate cause of a sensation. For example, the idea of hardness would be immediately consequent upon the feel of a resisting substance; that of roundness, upon the sight or touch of a spherical object; that of colour, upon the sight of something possessing

it; and so on. These, after having once been impressed upon the consciousness, may return before it at any time; and their return is commonly dependent upon the law of association, which tends to reproduce former combinations of thought. From this it happens that all the simple ideas excited by the several sensible qualities of a familiar object, by its hardness, its outline, its colour, etc., etc., are so constantly united in the mind, and are habitually contemplated in such immediate succession, that the separation between them ceases to be perceived; and they form, in the aggregate, an idea of the object itself, in which all its known qualities are included. Such ideas are said to be *complex*; and, from the results of a natural and unavoidable comparison between them, a third, and more advanced class, soon begins to be developed.

This third class of ideas, consisting of those which are denominated *abstract*, has its origin, probably, in a kind of analysis of that knowledge which the possession of several complex ideas will afford. The child is insensibly led to perceive that those qualities, whose recognition was among the first operations of his consciousness, may be possessed in common by distinct objects, and may be combined in widely different proportions. Hence he will abstract (*i. e.* separate or withdraw) these qualities, in his mind, from the other qualities of the objects in which he is accustomed to see them; and will be enabled to imagine their existence by themselves, or under circumstances of which he has, as yet, had no experience.

In this manner, the knowledge of objects and of

their qualities being gradually enlarged by observation, it is possible to conceive the formation of a great number of ideas, both simple and complex; some of them *sensational*, and having reference only to external things; others *intellectual*, and dealing with the mind itself, and with its relations to the surrounding universe.

But, as the growth and the mental capacity increase, the child is taught to distinguish its ideas by names; and, with the gradual mastery of language, there dawns a new era upon the intellectual life. The several qualities, ascertained by the other senses, can then be combined into new complex ideas, in conformity with verbal descriptions; and, not only so, but the sense of hearing itself is enabled to convey new qualities to the mind, its impressions being strictly objective, and holding the same position in regard to the brain, as those arising either from sight or touch. The combination of all these sources of information, (especially when the advancement of each successive age is rendered permanent by written records), appears to be sufficient for the gradual acquirement of all human knowledge; in so far as it relates to the conditions, or the occurrences, of the present state of being, and is not concerned with those truths which are learned from Revelation alone.

There is one important class of intellectual ideas, comprising those sentiments to which the term *moral* is applied in common parlance; and serving to illustrate how completely the human mind is dependent, for the comprehension of anything, upon the simple

ideas of qualities which result from the first contact of an infant with the world around it ; qualities which the adult can scarcely appreciate more clearly, except in recognizing various degrees of their presence, and of their display. Many of the moral feelings arise spontaneously in the minds of all persons ; although their intensity and combinations vary, in accordance with differences of education or temperament. But the method of expressing or describing them is derived entirely from a metaphorical application of certain words, which have been invented in order to express the material qualities, or physical changes, of the universe ; and, except by this means, it is impossible to convey any idea of their nature or effects. The generic term *emotion*, and the description of moral excellence by words which signify physical elevation, such as high, lofty, exalted, and the like, are examples sufficient to illustrate the real nature of the language of the passions. It frequently happens, too, that the sensational idea thus blended with the intellectual, and used as the medium of its expression, absolutely obscures the mental consciousness with regard to the true nature of the conception at issue. A striking instance of this is furnished by the great mass of unreflecting persons, who suffer an idea of physical elevation to blend itself, however confusedly, with their notions of the Divine Attributes.

Having thus glanced at the sources from which ideas first enter the mind, it will be requisite to consider, at somewhat greater length, the manner in which they are habitually recalled to it ; or, in other words, to describe that spontaneous succession of

the thoughts, which, during our waking hours, is continued without intermission.

In the ordinary state of consciousness, each idea that is brought before the mind, is found, after a brief period, to suggest another; and then to be disregarded, in order that the attention may dwell upon its successor. The transitions thus effected may either be extremely gradual, as in the case of connected reasoning; or they may pass through various degrees of abruptness, to that complete dislocation of the thoughts which is characteristic of some of the forms of insanity. Every idea may be regarded as a centre, from which a great number of lines diverge; each of them affording a track, along which the mind may travel in its farther progress: and the selection that is made between them being sometimes guided by definite rules; sometimes left to the most casual combination of circumstances. There are, however, for almost every individual, certain directions more attractive than the rest; and certain classes of ideas which take the firmest hold upon the memory, and present themselves most readily to the consciousness. These peculiarities may always be ascribed to the influence of volitional, or of automatic, attention; and the thoughts are said either to be directed, or to be led, into the particular channel of their exercise.

It is readily apparent that each successive link in a chain of ideas must afford a fresh starting point to the mind, and one that may turn its attention towards a new subject, having little or no connection with those which it had previously contemplated.¹ But it is

¹ For an example of this see page 50.

more common to see the associations of the first idea extend their influence to many of those which follow it; and, when the more extreme changes do occur, there is often reason to suppose that intermediate ideas may have passed through the mind without affecting the sensorium; and may thus have accomplished, by easy and natural gradations, a transition that appears to be abrupt.

Disregarding, however, such occurrences as these, which may be considered as having an exceptional or accidental character, it will be found that an idea present to the consciousness is connected with others, lying dormant in the memory, by means either of natural or of artificial associations; the former arising of necessity from the employment of the senses, and the latter, from events peculiar to the individual. If the name of any one be mentioned in conversation, the first desire of the mind is for an idea of his personal appearance; and this is at once recalled if he be known; or, if not, the information upon which to frame it is eagerly sought. In cases where no description can be obtained, an idea is commonly formed by the aid of imagination; and this idea, even when found to be inconsistent with the reality, can seldom be abandoned without some feelings of surprise. But, after the first and universal association has produced its effect, the subsequent direction of the thoughts will be determined by various circumstances; some persons, for instance, dwelling upon the intellectual history of the person mentioned; others upon his actions, or even upon the details of his private life; and others again, upon his position,

connections, or descent. There are, moreover, many other instances of ideas so correlated, that the naming of one of them is sure to suggest its fellow, without there being any certainty in the next step of the mental process.

Among the various results of artificial association, the power of punning is by no means the least curious. Those who acquire it, usually possess a retentive memory, and a ready access to its stores; but are wanting in capacity for the higher operations of the intellect. They attend chiefly to the associations of sound; and, in the order of their thoughts, attach the same importance to a meaningless jingle of words, that is assigned, by persons of judgment, to the relations of cause and effect; or to those exquisite creations of the faucy, which at once astonish and delight mankind. The pleasure experienced in hearing puns is supposed to depend upon a feeling of *surprise*;—excited by observing the prominence of an association, which, in ordinary minds, would have been amongst the last appealed to;—and akin to that produced by unexpected and ingenious bodily actions, such as feats of tumbling, or of sleight of hand. Genuine wit is subservient to the same kind of gratification in those who hear it; although expressive of a far higher order of mind in those by whom it is uttered. For, depending upon the rapid and correct perception of a remote but real analogy, it is founded upon absolute resemblances in the nature of things; and requires a thorough comprehension of both the ideas, which, by its means, are brought into unexpected relation.

The history of superstitious observances and beliefs will often afford admirable examples of artificial association. Generally invented by a priesthood, as additional guardians of the sanctity of some holy day, or some religious rite, the coincidences in support of them have been observed and remembered; while the contrary instances have escaped notice, there being no opposing superstition the adherents of which might employ them. For instance, Friday is commonly supposed to be unlucky; and many people would shrink from being married, or from starting on a voyage, or from commencing any important undertaking, upon this particular day. But (deducting such as have arisen from fear consequent upon the superstition) there is no reason to believe that the disasters connected with Friday have been more numerous than those which have occurred upon any other day of the week. It is simply that an association has been formed between that day and the least fortunate of its events; and, at the time when the belief originated, any other day might have been similarly condemned.

The effect of certain habits of association in determining the general tone of the intellectual and moral character (without reference to particular contingencies, or individual articles of belief), is so familiar as scarcely to require notice; but, at the same time, so important, that it cannot be passed over in total silence. There are large classes of persons who differ widely from the majority of their fellows in the view they take of the common affairs of daily life. Some individuals have a keen perception of the ludicrous, others are said to be sanguine, and others to be melan-

choly. In all these instances an habitual association warps the judgment; and prevents it from giving proper attention to ideas that would modify its decision. The intellectual condition of those whose minds are clouded by gloomy visions of the future, or cheered by extravagant and groundless expectations, bears a striking resemblance to that of the "electro-biologized" subject, who, whilst drinking water, believes it to be wine; in consequence of excessive attention to certain sensory impressions, and neglect of those which should correct them. In like manner, the enthusiast and the fanatic are placed beyond the control of reason; and cannot assign a proper value to the experience or the opinions of mankind, because these are prevented from reaching them in their proper force and intensity.

It will at once be evident, that the number and diversity of the casual associations between the matters of our knowledge, must constitute a formidable obstacle to the regular and systematic government of the thoughts; and must continually tempt the mind to wander from its subject, and to stray into paths that have no bearing towards its goal. To ensure such government, and to check such wandering, are, however, matters of paramount importance, both in their effects upon conduct and morality, and by reason of their influence in forming the predominant emotions. The difficulties that interfere with the attainment of objects so desirable, require, therefore, to be carefully considered, in every judicious scheme of moral education; and to be provided against as far as may be possible: while, at the same time, both pupil and

teacher should regard these difficulties as stimulants to exertion, rather than as barriers against progress.

The chief source of the artificial or accidental associations by which unconnected ideas are often linked together, and by which the natural order of reflection is disturbed, must be sought for in that *inexactness* of knowledge which is one result of the wide spread of elementary instruction. When an idea is thoroughly understood, its relations to others are rendered definite and precise; and associations devoid of real foundation speedily lose their hold and disappear. But when it is only half-formed (so to speak), or when its boundaries are uncertain and obscure, the thoughts may stray from it in any or every direction; and, like a person moving in the dark, may arrive at a point foreign to their destination, by steps which it would be difficult or impossible to retrace. The various charlatans who prey upon the credulity of the public, act upon a practical knowledge of the principle above laid down; often giving *explanations* of their doctrines, and resting these explanations upon some prominent idea, the name of which is familiar to the mass of educated people, while its real nature and bearings are known only to a few. Thus, the itinerant professors of mesmerism were accustomed to explain their performances by referring the results to the agency of *electricity* or of *magnetism*; powers, of which, in general, they themselves knew as little as their audiences. But people who had heard of electricity, and had been told that it was the immediate cause of thunder and lightning, and that it sent messages by telegraph, and who had

never cared to inquire or know farther concerning it, were quite ready to believe that it might accomplish anything else; and received a word, which, for them, had absolutely no meaning, as a satisfaction of all doubts, and an answer to all inquiries. In the same way, the professors of homœopathy, when they meet with a person whose credulity is unequal to a belief in the physical potency of their globules, commonly take refuge in the idea of a "spiritual influence," and escape from simple lying into rigmarole. They know very well how few persons have ever reflected upon the meaning of the word "spirit;" and, although they may possibly fail to perceive the full measure of their own irreverence and absurdity (when regarded as thinking creatures, with minds originally fitted for the pursuit and appreciation of truth), it is impossible to deny that a profound knowledge of human nature leads them to retire from facts behind a cloud of ambiguous words; and to shroud themselves within the obscurity that weakness is so ready to mistake for wisdom.

The first thing, therefore, that should be attended to in the education of the mind, is to render its ideas as definite and exact as possible; directing especial attention to the importance of this element, so that the learner may not attempt to reason from those which do not possess it. The knowledge that is gained may fairly be arranged into two great divisions; the first, comprising ideas that are complete, and that are available for all the purposes of the intellect; the second, ideas in the course of formation, and requiring to be perfected before they can be employed. It is the

use of the latter class, as material for the judgment, that produces nearly all the intellectual errors of mankind; and that causes so many powerful minds to present shapeless masses of prejudice and error, built in, here and there, with the general structure of their opinions, and defacing, by their unsightliness, the edifice that they weaken by their irregularity. The dangers of such abuse as this, once pointed out, may be regarded as half overcome; and many "fears of the brave, and follies of the wise," stand, as imperishable monuments, to give force and liveliness to the admonition. In science, in divinity, in morals, in commerce, in all the questions that excite human interest or exercise human ingenuity, the path of the inquirer is beset by colossal ruins, the work of architects whose palaces have been built upon the sand; and whose systems, deserted by the philosopher, still afford shelter to the unclean beasts of the intellect, and screen error or superstition from the light of the sun. In these days of division of labour, when nearly every man must admit the limitation of his own powers, and must smile continually at the blunders of those who, without the necessary instruction, intrude themselves upon his province, it is truly astonishing to see how little the practical inferences deduced from ordinary business are allowed to control the operations of the mind, or to restrain the conclusions of the judgment. Persons, for instance, who would not attempt to cure themselves of a disorder, and who would at once confess their want of the requisite information, have no scruple in trusting their health to a quack, whose skill rests entirely upon

the evidence of his bare assertion ; and whose knowledge they can only measure by the standard of their own admitted ignorance. Still, they do not perceive that their indefinite ideas should be excluded from the number of those that guide their conduct ; on a principle similar to that by which hearsay evidence is excluded from a court of justice.

In the mental training of children, especially in their early years, ideas are only accessible through the medium of the words joined to them ; and, therefore, the attention of the educator should be directed, to procuring the use of these words in an exact, a correct, and an uniform sense. For this purpose, their literal meanings should be explained ; and then the more simple metaphorical applications of which they are susceptible. Etymology may often be made useful in furnishing associations by which these meanings will be remembered ; and, in the compounds derived from our own language, it will be available at an earlier age than might be supposed. When children speak ambiguously, it will generally be found that they know their own meaning very well ; and are incorrect, or obscure, only in the words by which they strive to express it. Pains should then be taken to elicit their exact thoughts, and to explain how they might have made them understood ; their blunders being always treated as the mistakes of a learner, inevitable, it is true, in themselves, but to be carefully guarded against for the future. The acquisition of habitual correctness and precision of language should be made the most important part of a child's intellectual cultivation ; the selection and proper application of the nouns and

verbs, and especially of the comparative and superlative degree, being at first regarded as of more importance than the grammatical construction of the sentences. The former will produce an early habit of exact thinking, and of accurate speech; but the latter is an accomplishment that time may bring in its train,—at least, to those who read polite literature, or have opportunities of mixing in polite society.

Among the many varieties of verbal inaccuracy, perhaps the most injurious is a tendency to exaggeration, whether it have reference to facts or to feelings. Its development may often be checked by great watchfulness with regard to the use of the superlative degree: a form of speech which should, almost, be expunged from a child's vocabulary; so few are the events to which it can be applied with propriety, and so manifold are the evil consequences of its abuse. Strong expressions always react upon, and strengthen, the convictions of those who use them; and, when applied in a personal sense, they have a direct tendency to establish the dominion of the idea to which they relate, and to emancipate it from the control of the Will. Exaggeration of feeling is a constant element of hysteria; and is always most remarkable in the more vicious cases, being an ordinary prelude to the exercise of pure invention. Moreover, in society generally, exaggeration of every kind is observed in close connection with weakness of intellect or deficiency of principle: the use of superlatives, to describe the common affairs of life, proving, either that undue and absurd importance is attached to them, or, that the boundaries of truth are overstepped un-

consciously, from habitual disregard of their sacred character.

Proceeding, with advancing years, from the general to the more particular, there are certain ideas which stand upon the very threshold of the temple of Nature, and which, together with the words linked to them, should be carefully explained whenever an opportunity can be found. These are such as relate to the regular succession of natural phenomena; and are expressed by the words "cause" and "effect," "law" and "theory." The doctrines of causation may readily be made intelligible to a child, if divested of the jargon which has been attached to them; and their right comprehension, as a basis of education, would save much confusion of thought in after-life; more especially, by teaching the mind to require an adequate reason for the events occurring around it, and to reject unmeaning or unsatisfactory explanations of them. It would be sufficient to teach the general truth, that the *causes* recognized in the world are themselves only the *effects* of the Divine Will; and, then, to point out their relations to their immediate consequences. The stability of the order of nature, the uniform recurrence of the seasons and of their events, the alternation of day and night, are circumstances that offer themselves in illustration of the "law," or Divine Ordinance, that is presumed; and of the "theory," or generalized expression of facts, that is deduced, from their occurrence. By directing attention to these, the mind will insensibly be led always to seek for a reason, and to expect a consequence; and will be trained in that regular and constant use of its faculties, without which, the mere

attainment of learning is a waste of time and of exertion.

The plan of mental education indicated above, would, it must be obvious, produce minds especially fitted for the interrogation of nature; and for the advancement of those sciences which depend upon observation. It may be regarded as one of the peculiar misfortunes of the present age, to abound in men of great acuteness and ingenuity, who, nevertheless, have not learned to be accurate; and who are scarcely conscious of their deficiency. In their hands, speculation and conjecture cease to be useful, because no longer separated, by a distinct boundary, from the confines of positive knowledge; and any addition which they make to the stock of facts, is sure to be encumbered by hypothesis, and to be announced in a manner that leaves it doubtful where truth ends, and where uncertainty commences. They reason, in the same breath, from a fact, and from a fanciful explanation of it; and bring sound principles into discredit by the absurdity of the inferences drawn from them. But an intellect trained to habits of strict veracity, and of close exactness, could not fall into such errors as these; and, if it seemed to make but slow progress in the prosecution of scientific inquiry, still its steps would never require to be retraced. Putting aside, however, the limited number of persons to whom the last sentences would apply, there can be no question of the utility of exactness even to those whose minds are only exercised upon the simplest matters. It is said, I believe with perfect justice, that a large proportion of educated people would be

unable to give a perfectly correct account of any occurrence that might happen under their observation; and this, in a society where so much is constantly dependent upon evidence, must be admitted to be no small misfortune. The moral and social evils consequent upon inaccuracy are too numerous, and too grave, to require more than this cursory reference to them; but they furnish a powerful argument in favour of any system by which their amount might be diminished. These considerations, however, are thrown out only as suggestions to the reader; and have but an indirect bearing upon the present subject of discussion: namely, the effect of exactness in producing well-defined ideas; and in so diminishing the number of casual associations between them as to lessen the liability to spontaneous wandering of the thoughts.

The number and variety of the pursuits in which the human mind may be engaged, lead of necessity to a classification of knowledge, in accordance with the objects with which it deals. Among the divisions thus effected, it is not easy to discover much common ground; but the study of the nature and value of evidence may be considered as forming the proper foundation of the intellectual character, however exercised; and the study of the obligations due from man to his Maker, as holding the same relation to morality.

The study of evidence is one to which the minds of children should be led by the inquiry—*How* do you know?—and by pointing out the several ways in which they are most likely to be misinformed, either

by an erroneous interpretation of their own sensations, or by the reception of false, or incomplete, intelligence from others. Their continual liability to be mistaken should be carefully impressed upon their minds; in order that the fear of error, in themselves, may protect them from obstinacy and from rashness; and that the knowledge of its occurrence, in others, may prevent an excessive or undue credulity. With increasing intelligence, the lessons should be made more definite; and it should be shown that the value of evidence increases, in proportion to the probability of the circumstance that it tends to prove. For instance, an event that may be fairly expected, may be rationally believed upon very slender testimony; such as would require strengthening, if the event were unlikely. But, in daily life, assent is constantly required to statements so highly improbable, that no amount or combination of human (and therefore fallible) testimony could warrant a belief in them. It was said by Fontenelle, that the number of persons who believe a particular thing, does not, in the least, add to its credibility; but that every one of those who doubt, diminishes it. In spite of popular delusions, a person of judgment would suppose the multitude to be either mistaken, or deceived, before he would admit the medicinal efficacy of a homœopathic globule, or the power of a mesmerised girl to pierce the usual barriers of vision. But, in order to see the difficulties in the way of either supposition, some little special information is required; from which fact the general conclusion may be drawn, that persons can form a correct estimate of the value of evidence, only

when it bears upon subjects with which they are conversant; and that, with regard to all others, they should either acknowledge ignorance, or be content to remain in doubt.

The obligations of man to his Maker, and, by consequence, to his fellow man, cannot be fully discussed, at any time, without trenching upon sectarian and political questions, of a kind that produce strife more frequently than concord. But reflection will show how many of these questions must have arisen from the want of precise teaching; and it is probable that, if the supporters of different opinions would frame and promulgate exact accounts of their respective tenets, points of unsuspected agreement would be immediately discovered, and imaginary differences would, in many cases, disappear: in consequence of the increased facilities for comparison between them. Real differences, too, would be stript of their accidental qualifications, and would rest for support upon their own merits; so that it would scarcely be possible for any one to halt between them; or to avoid a recognition of the right. In like manner, if parents were careful to define their own religious and moral principles; and then to instil distinct ideas of them into the minds of their children; these children would be furnished with a standard for the examination of their conduct; and might often avoid, from their tendency, actions which they now repent, from their effects. The beginnings of great evils may frequently be traced to the confused ideas of conscientious men, who, if they had been habituated to think clearly, would have foreseen

the probable results of their proceedings, and would so have altered their conduct as to escape them.

Among the points of difference between sects, both in matters of belief and conduct, there are some that can only be redeemed from inexactness, by a prior consideration of the boundaries of human knowledge, and the limitation of the human faculties. It should be taught, that things which are perceptible, neither to the external senses, nor to the internal consciousness, can be made known only by revelation; and that, where revelation is silent or ambiguous, the reason cannot, by any arts whatsoever, advance a single step in the inquiry. The happiness or the misery of a future state of being cannot be thought about, except by the aid of the present conditions of existence; and by adding ideas of degree to those bodily and mental sensations which we feel and realize upon earth. The conceptions which we form of the Deity, whether approaching to the Pantheistic, or the Anthropomorphic character, are founded upon a sublimation of human qualities, variously combined in the imagination of the individual thinker. The word eternity can excite no idea beyond that of *long* duration, however we may strive to qualify it. All arguments, therefore, having reference to things which we *cannot* know, and to questions which we *cannot* determine, may in strict propriety be described as nonsense: serving only to divert the mind from its proper object, the pursuit of attainable truths; and to waste its energies upon shadowy distinctions, and mere verbal quibbling. The parent who teaches his child to be precise in his knowledge, should also teach him to be candid in his

ignorance ; and to avoid those paths, however tempting, in which he cannot be preceded by his accustomed guides. There will still be revelation enough to exercise his faith ; and rules, more than sufficient, for the regulation of his conduct. In proceeding farther, he passes into a region of obscurity, in which authority ceases to have weight ; and in which the sage and the peasant are placed upon a common level. The glimpses of light afforded, here and there, by the sacred writings, although they may occasion a certain belief in the mind of one reader, afford him no means of reproducing it in that of another ; and lead the most sincere inquirers after truth into the most opposite opinions concerning it : each, perhaps (if I may venture upon the use of a physical analogy), travelling by a distinct road towards a common goal, but each stopping somewhat short of its absolute attainment, and each perceiving a different portion of its outline. It may be, that these glimpses excite, in every man, the ideas most consonant to his own spiritual nature, and best calculated to furnish him with proper motives ; but that they are not intended to be imparted to others ; or to supply springs of action, except to the mind in which they originate. On this supposition, they would have been less useful, if more definite ; and, although it is conceivable that a belief (for example) either in predestination or in free will, may fulfil a purpose in its operation upon the individual, it is inconceivable that men should expect to make converts, even to their most cherished convictions, when their ideas about them are the products of imagination, and their words the language of metaphor.

It may possibly occur, as an objection, to certain of my readers, that the exactness upon which so much stress has been laid, would, if obtained, curtail the imaginative faculty; and cause people to be unpleasantly "matter of fact." In this belief, I think they would be mistaken; an opinion based, chiefly, upon the following reasons.

It is commonly said and admitted that the value of a personal anecdote depends, not so much upon its being literally true, as upon its being characteristic of the individual of whom it is related. Thus, an anecdote that is circumstantially false may convey a just idea to the mind, may facilitate its recollection, and may be a valuable adjunct to history. Many of the current stories of great personages are, without doubt, of this description; and are only so far trustworthy that they must have been founded upon a real trait of temper or disposition. Others, again, are false both literally and in spirit: the circumstances never having occurred, and the action imputed to the hero being such as he would not have committed: of these, the story of Newton and his dog Diamond is one of the most remarkable.¹ It is plain that true anecdotes may sometimes be exceptional with regard to character; and may convey erroneous general impressions, just as those which are false may convey true ones; and it follows that the exactness to be desired in them is an exactness of ideas rather than of circum-

¹ The facts were, that Newton's papers were burnt, by a candle which he had himself left amongst them, and that his agitation and distress were so great as to give rise to a report that he had become insane.

stance: the former being generally characteristic, and the latter always accidental.

It is not difficult to extend a somewhat similar principle to longer and more pretentious works of imagination; which may, without paradox, be true at the same time that they are fictitious.¹ For, as it is the province of imagination to arrange ideas into new combinations, and constantly to alter, although it can never create, the images it produces may either be exact, that is, in perfect harmony with reality; or they may be of the most vague and unnatural character, so as to excite no response in the minds of those who read of them. Images of the former class are to be found only in fictions of the highest order of merit; and they show an exercise of the closest observation, as well as of the most exact descriptive power.

There is, at the present day, a novel writer of great merit, and of European celebrity, whose works are chiefly remarkable for their minute descriptions of daily events, and of common scenery. He will conduct his readers into a cottage, and will give language to the purr of a cat, or to the song of a kettle. He will lead them forth, and show how the wind carries dry leaves into a corner, and whirls them about and plays with them at its pleasure. He gives to his characters striking and life-like mannerisms and ges-

¹ For the sake of precision of language, it may be well to state, that works of fiction are the result of conjoined *fancy* and *imagination*. *Fancy* supplies ideas, from the stores of observation and thought. *Imagination* arranges them into new and various combinations. *Fancy* is said to be luxuriant. *Imagination* to be grand or sublime.

tures, by which they would, it is said, be recognized, if they were ever seen. And all this detail, which is sustained by individual genius, and becomes ridiculous as soon as it is feebly imitated, pleases a vast number of readers, by the precise and lively images which it brings before them. In their walks abroad, in their social and domestic life, they have constantly seen such occurrences and such conduct as the author depicts; and they perceive, in a moment, the exact truthfulness of his writing. They themselves have observed, sufficiently to recognize with pleasure, but not sufficiently to describe; and they feel an agreeable surprise at the recall of that which they have seen to be true, but which they would have thought too trivial to be remembered, unless by the aid of suggestion. Persons who criticise more deeply, complain, with some justice, that this accuracy deals chiefly with superficial things; that it is wonderfully close to the appearances of nature, and to the detached actions of mankind; but that it does not extend to the causes from which those actions spring. Hence, the development of a character is seldom in harmony with nature, although each isolated phase may be so; and the whole, when taken together, is less satisfactory than any of its parts. Nevertheless, events are the things with which the majority of readers chiefly concern themselves; and a good description of these will always excite admiration, and command sympathy.

There is yet another writer, whose talent is of a very different order; and whose claim on the attention rests upon different grounds. He describes, it is true, the manners and the actions of his characters;

but he leaves an impression on the mind, rather than on the subjective senses ; and excites ideas of motives, and passions, and feelings, rather than of personal oddities, or bodily gesture. He seems to have raised a veil from the hearts of men and women, so as to display their conduct with the exactness of their own consciousness ; and with the impartiality of an unconcerned, but watchful, spectator. Instead of descriptions of strangers, his books contain the images of familiar friends ; and furnish nicknames—for the acquaintances of every reader. Nothing but the universality of the resemblance forbids the idea that his sketches are personal studies ; or leads to the conclusion that he has delineated the features common to classes, rather than those which belong to the individual man. The very absence of personal detail facilitates the recognition of his originals, for they are to be recognized everywhere : in all ranks and situations ; in the pages of the historian ; and in the events of yesterday. Human nature is the subject of his pen ; and it is unchanged, in all essentials, either by the thin disguise of fashion, or by the progress of succeeding generations.

Now such authors as those alluded to above, differ from, and surpass, the average, chiefly by reason of their greater exactness. Books, in which the hero is endowed with every virtue, and the heroine with every charm,—in which the parts of the remaining personages may be expressed by a single word for each ; as a lover, a villain, a rich uncle, and a penitent knave :—do not require, or at least do not display, this high intellectual quality. The lover has only to be sufficiently ardent, the villain to be sufficiently de-

praved, the penitent has only to confess in time, the rich uncle to die at the right conjuncture, and then the objects of the writer are achieved. The vicissitudes of fortune, the hairbreadth escapes, the curious coincidences, the wonderful adventures, that constantly occur in real life, are, proverbially, too strange to be magnified in fiction. They afford an inexhaustible supply of events suited for the framework of an ordinary novel; and among which the stereotyped heroes of romance may easily be made to play their parts. Very different is the task of the author who endeavours to frame, in his imagination, "that medley of passions and follies, a *Man*:" to present that conflict of opposing interests and feelings, that singular inconsistency of conduct, and that continual acting against reason and belief, which many persons realize in themselves; and many more observe and criticise in their neighbours. Nothing but exactness can save the work from being unreal; or can furnish the materials that are necessary to the success of the undertaking. Exactness, therefore, so far from being prejudicial to the imagination, actually gives life and reality to its works; and, so far from restraining its growth, does but restrict it to a proper and salutary nourishment: excluding those vague notions which might conduce to its sudden increase; but only at the expense of real vigour, and with the certainty of premature decay.

From the subject of the formation of ideas, and the influence of exactness in limiting their associative tendency, the mind is easily led to the principles on which associations should, as far as possible, be

founded; and to the means by which their formation may be promoted or controlled.

The doctrine of Hume, that all associations are dependent either upon resemblance, contiguity of time or place, or cause and effect, has been mentioned in a former chapter; and, although it is admitted not to be sufficiently comprehensive, still it will be found useful as a guide. It suggests, immediately, a somewhat different arrangement; inasmuch as the associations produced by resemblance, and those which link effects to their causes, are manifestly due to actual relationship between the respective ideas; while those ascribed to contiguity of time or place may connect ideas destitute of any other bond of union. Hence, there are real or essential, and accidental, associations: the first being due, for the most part, to volitional attention; and the second, much more common, to automatic.

An eclipse of the sun or moon is a phenomenon that can scarcely fail to engage the attention, and to guide the thoughts, of all the persons who behold it; but the ideas that it excites will be subject to great variation. The savage, or the uninstructed peasant, would have no associations but those of time and place, modified in their effects by his emotions of terror or surprise. The events, therefore, that had followed former eclipses, or had happened in the places from which he had observed them, would supply the first ideas recalled to his mind; such events, especially, as were of a gloomy, calamitous, or unusual character. A person of no great intellect or attainments, but sufficiently educated to know the depen-

dence of an eclipse upon natural causes, would have no emotions in connection with it; but time and place would still govern the course of his ideas, and would remind him of the incidents most kindred to his disposition. A philosopher, accustomed chiefly to the associations of resemblance and of cause, would think of the manner in which eclipses are produced, or of the methods by which they are foretold; and, if his knowledge were imperfect, he would probably endeavour to supply the deficiency.

In the same way, although often in a less evident and striking degree, every event that engages the attention serves to divert or control the current of mental activity. If this tendency be suffered to take its course, events will be linked together in the mind, according to the order and the place of their occurrence; and with little reference to any more real connection. If, however, the development of the associative faculty be made an object of diligent attention, ideas will be stored in the memory in the order of their causes; and will be united together, by virtue of their actual relationship.

In primitive and simple states of society, the associations of time and place will, generally, include those of cause and effect; and will greatly facilitate the use of experience in the government of the conduct. A savage, who depends for his existence upon the acuteness of his senses, and who is guided to his prey, or assisted in his flight from danger, by a keener sight and hearing than that of his civilized fellow-creatures, requires a concentration of nervous force upon his sensorial organs, and a corresponding economy of

cerebral activity. This economy is greatly promoted by the links of time and place, which enable him to apprehend easily, and without mental effort, those natural sequences of events, the knowledge of which is necessary to his preservation. Thus, the sight of green herbage guides him in his search for water; and the sight of smoke in his search for fire: not by the intellectual idea of causation, but in a much more easy manner. With the progress of civilization, however, the multiplication of events produces a great number of merely chance coincidences; and it is necessary for those, who desire accurate knowledge, to correct their first and simplest associations by others, less evident, but far less liable to mislead. Nature has given the requisite power to all; and the nervous force, required for its exercise, is supplied by the diminished energy of the sensorium. A child, in his little world, may still trust to the most obvious links; but, unless he be early guided into better habits, either by the aid of his teachers, or by the lessons of circumstance, his knowledge will be rendered useless to him, from the want of a proper arrangement of its parts. He will constantly be at a loss for information, just when it is most required, and when the presence of a kindred idea should at once recall it to his mind; but the lost fact will be recovered, after a time, by the aid of some purely accidental clue, such as the sight of the book in which he read it, or of the person by whom it was related. Nothing is more common than complete forgetfulness of the results of school teaching, more especially of such teaching as falls to the lot of young ladies. History, geography,

languages, smatterings of science, all are said to have been learned ; and all, when they might be useful in life, are found to be quietly forgotten. If the pupils could be taken back to the old schoolroom, and placed in a row before the teacher, it is probable that their former tasks might be brought to their recollection ; but, when these tasks were first committed to memory, no attempt was made to surround them with reasonable associations, or to connect the events they referred to in the order of cause and effect with each other ; and so, when similar events take their places among the topics of the day, they never disturb the tranquil slumber of their unremembered kindred.

The first step in the culture of association should be to direct attention towards the points of resemblance between related ideas : a purpose that can only be accomplished by the exercise of considerable judgment on the part of the instructor. For there are many apparent resemblances, both in life and in books, that have no basis in reality ; and that speedily disappear, under a thorough examination of the ideas which seem to be connected by them. In all ages, however, many persons have been misled by seeming likeness, and fallacious analogy ; and have held, defended, and even suffered for, opinions that were literally blunders. The natural tendency of the mind, in applying its experience to apparent resemblance, is to confound together things that are really different ; and this tendency requires to be corrected by the aid of education, while, as would be supposed, the greatest possible protection against it is afforded by a habit of exactness in the formation of ideas ; a habit that must

be made the groundwork of all classification, as well as of all distinction. It permits the tracing out of similarity between objects, or between states of consciousness,—through that harmony of parts which is called complete resemblance, and that correspondence with regard to some circumstances or effects which constitutes analogy,—until the connection is severed by an essential difference, and the classes of ideas are disjoined in the mind: although still associated together, perhaps by reason of their very diversity.

The most useful and complete analogies must necessarily be those springing from the unity of design which characterises all the workings of Divine Providence; and through which “the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made.” Perhaps no one ever attempted to convey, to a child, an idea of a future state, without reminding him of the seed, of which the husk perishes in its germination; of the egg, which contains the embryo of a sentient existence; of the grub, which emerges from its chrysalis to a more beautiful and more exalted life. Besides these well-known instances, there are many others, in which the less evident among the changes of the world itself, or of the vitality which it sustains, may be rendered intelligible by the light of parallel and more familiar events; and those who are conversant with any department of science, or with any art, cannot fail to perceive, and to be able sometimes to explain, how its principles shadow forth, and harmonize with, the *general* government of the universe.

But, among the so-called analogies current in daily

talk, there are many unsuited for the instruction of a child; either because they are positively untrue; or because the resemblance depends upon some secondary or subordinate features of the ideas which present it, and is not to be traced between the qualities which determine their essential nature. For instance, it is incorrect to apply the word parental to the office of a political governor, or of a religious teacher; because the object of the parental relation is the preparation of an immature animal for independent existence; and the duty of controlling, or of instructing, is but one, among others of greater importance. Again, it is incorrect to point to the lower animals as instances of qualities which they do not possess; and, while the bee or the ant are legitimate examples of industry, they should not be spoken of as examples of prudence. For children are quick to perceive many errors which they are unable to expose; and they would see clearly that there can be no real contrast, or resemblance, between themselves and insects, as far as the causes of their actions are concerned; while any attempt to convince the young by the use of transparent fallacies, is certain, like any exaggeration of their offences, to produce an effect contrary to that which is desired; and to diminish, instead of increasing, the force of the lesson that is to be taught.

While resemblance, in its various degrees, engages the attention of children from a very early age, and affords an active and valuable stimulus to the exercise of their perceptive faculties, they display, also, a remarkable curiosity with regard to the causes of the events happening around them; and have the word

why constantly upon their lips. It is probable that their intellectual character in after life depends, very greatly, upon the manner in which this *why* is habitually responded to. If the answer be of a vague and unsatisfactory character; or if the child be dismissed with a careless word, or even without encouragement to continue his inquiries, one of two consequences will be likely to occur. Either he will be satisfied with insufficient explanations, or else, finding that reasons are not readily furnished to him, and that they do not obtain the praise often accorded to the recollection of facts, he will soon disregard the former, and will be content with the mere acquisition of words, which may carry him with credit through an examination, but will add nothing to the real capacity of his mind. If, on the other hand, the parent or instructor earnestly strive to gratify the desire for knowledge:—not, however, affording information so readily as to diminish its apparent value, but only aiding in the search for it, and insuring its thorough comprehension when obtained:—what different results may reasonably be anticipated. The pupil will be taught to reflect, instead of being only called upon to remember; and his ideas, though they accumulate slowly, will be arranged in such a manner as to be ready for immediate use, and will be secured against the very possibility of forgetfulness.

So soon as the observation of resemblance, and the endeavour to trace out causation, have been rendered habitual by practice, all new ideas, of whatever character, will be considered with reference to these two relations; and, consequently, will be associated in the

mind with those that have produced them, and with those that they are like. It follows that they will be remembered in the right place, consecutively to these their kindred; and that all the knowledge possessed upon any subject, will be suggested by whatever brings that subject before the consciousness. It is a matter of painful experience to many persons, that their information is not disposed in this way; that the right word, or the right fact, occurs to them, very frequently, only as an afterthought; and is absent when its presence would have been most useful. And, perhaps, during their endeavour to recall it, many intrusive and irrelevant ideas start up, connected with the main topic by reason only of the place where, or of the person from whom, they have been acquired;—or by other casual and perplexing associations,—distracting the attention by their number and variety. It will be seen that this random connection between the thoughts must, where it prevails extensively, lapse by degrees into positive incoherence: the links of time and place being altogether unsuitable to the circumstances of civilized society; which require the exercise of judgment in order to their proper separation and arrangement in the mind. There are, however, methods in which these easily formed associations may be rendered useful, in facilitating the remembrance of dates, of the succession of historical events, or of other arbitrary facts; and they form the basis of the various mnemonic systems, which, from time to time, have been brought before the public. There is a great and self-evident difference between this employment of them, in which the place and

succession of the things to be remembered are first determined by the judgment; and that which allows them to unite permanently the fortuitous combinations of daily events, or of floating information. The former compensates, in some degree, for the paucity of the natural associations by which certain ideas are surrounded; the latter would be a constant source of error, except in a state of existence so simple, that the succession, and the causation, of its events were commonly coincident.

The regulation of ideas, so as to secure the greatest attainable vigour, and utility, of the intellect, and to afford the greatest possible protection to the mind, when assailed by a crowd of exciting or conflicting circumstances, should be attempted, therefore, by steady and unwavering adherence to two great principles: the first teaching the necessity for precision and exactness in their formation: the second, for constant watchfulness over the character of the links by which they are united. A just appreciation of their relative value and importance is, of course, greatly to be desired; but for this it is scarcely possible to imagine a common measure, so widely do the pursuits, inclinations, and positions of individuals differ from each other; and so completely is the treasure of one man considered worthless by his neighbour. But, however various are the different estimates of the proportional value of worldly things, their absolute value may be measured by an unalterable standard; and to this they should be brought,—by the child, in obedience to precept and example; by the man, from experience of its utility,—not only

when prosperity threatens to overturn the mind, or adversity to paralyse it, but in those more ordinary circumstances of daily life, which, trivial although they be, are still misleading, unless regarded with constant reference to the life that is to come hereafter.

The regulation of the Volitions, or operations of the Will, by the aid of education, must be attempted in a twofold manner: the first object being to strengthen and develop the power of the faculty itself: the second, to determine the direction in which it shall be exerted.

With regard to the first, it must be remembered that we recognize an energetic will as the immediate cause of perseverance; and that, consequently, to form a habit of persevering, either in matters of thought or action, is to develop the faculty upon which such a habit must be founded. To this end, therefore, the efforts of the instructor should be directed; and the child should be encouraged to go on with his several undertakings, whether of study or of sport, not so much by precept or injunction, as by indirect assistance whenever his energy, or his interest, appears to flag. There would be room for the exercise of considerable judgment with respect to the time when the utility of perseverance should be put before him, in so many words, and appealed to as a motive for continued exertion; but, generally speaking, this should not be done until his own experience can supply illustrations of the statement. It will then have much more force, and can be presented in a guise much more practical. Abstract truths,

however simple or self evident they may be, are very unproductive in the minds of children, who can scarcely ever be made to see their application to the particular case, and who shrink from them with a sort of instinctive repugnance, at times when they would be pleased by, and would act upon, an example taken from the events of yesterday.

In order to cultivate proper habits of mental attention, and to exercise the will in the guidance of the thoughts, the instructor must do for the child, by suggestion, what he himself does by the exercise of judgment; that is, he must select, from the ideas that successively present themselves, those most worthy of examination; and must keep them prominently before the consciousness for a time, gently and patiently drawing back the mind of his pupil, whenever a tendency to wandering becomes apparent. If there be some study in which progress is desired, even if it be only that of the alphabet, the same hour and the same place should be reserved for the daily lesson; and thus the associations connected with these circumstances will assist, not only in recalling that which has been learned, but also in fixing the mind upon a subject to which it is, then and there, accustomed to address itself. And a judicious teacher, knowing the value and importance of undivided attention, will seek to withhold everything that is likely to distract it; will avoid the presence of unaccustomed persons during the lesson; will secure the room from thoughtless intrusion; and will exclude, by a blind, the disturbing effect of a window prospect. In time, the habit of contemplating certain ideas more closely,

and for a longer period, than their actual attractiveness would require, being once formed, will admit of being practised at pleasure; and the power of volitional attention, thus obtained, may be increased to almost any extent by exerting it.

The control of the muscular system is to be acquired in the way already mentioned, under the head of 'Exercise.' All movements that are directed towards the accomplishment of a definite purpose, strengthen the power of the will to determine the bodily actions; and all that are objectless, or that are performed, as walking may be, during a state of reverie, have a contrary tendency; accustoming the muscles to be subjected to instinctive force, and rendering them less able to resist it. The principle to be remembered is, that the activity and exuberant spirits of the young, without being unnaturally restrained, should be exerted in the pursuit of some known object; and that, whether they play or work, their movements should be, as far as possible, intentional, and executed for the fulfilment of a purpose. When children are together, their games, although not all equally beneficial, are mostly of a sufficiently purposive character; and when a child is left without companions, the desire for activity may be satisfied, by requesting him to do something in which his assistance will appear to be useful or important. Management, in these respects, should be commenced at an early age; and the habits then formed will be confirmed by growth and practice.

The government of volition with regard to the thing willed, is a most important element in the formation

of character, and in the determination of conduct; inasmuch as the faculty itself may be exercised in any direction, either moral, intellectual, or physical; and may be the sustaining power of vice or folly, as well as of virtue or wisdom. At the same time, it so greatly increases the weight and influence of a person who possesses it in an unusual degree, that its mode of operation is highly important to the general well-being of society; and those who cultivate it in their children, as the especial, and almost divine prerogative of humanity, incur a weighty responsibility with regard to the bias it receives from them.

It would appear likely, at first sight, that a sufficient safeguard against the abuse of volition would be afforded by an average amount of sagacity or judgment; but this expectation, reasonable as it seems, is not verified by experience. That "honesty is the best policy," will seldom restrain a clever knave from fraud; because, how completely soever he may realise the general correctness of the maxim, he will still trust to his own ingenuity to screen himself from detection. As a rule, moreover, persons of very strong will do not accurately weigh the circumstances of their position; but fix their minds upon the subject of their wishes; and misconceive the character of the obstacles in the way simply from inattention to them. Unless, therefore, they bring their conduct to the standard of high moral and religious principles, such persons will be prone to continual lapses from the path of right; and they will find no safety in the clearest intellect, if it be only exerted in deciding between opposite worldly motives; and if attention

to a thing that is desired diminishes the apparent importance of a future contingency. Moreover, the understanding is not an autocratic faculty,—and its most assured conclusions are oftentimes disregarded in practice, being either overruled by passion, or neglected through carelessness;¹ so that it is necessary, on these accounts, to supersede its dominion by one on which more certain reliance can be placed.

For this purpose the attention should be directed, at a very early age, to those ideas of duty and responsibility which arise out of the Christian dispen-

¹ In order to point out the character of the natural relation between the Will and the Understanding, I cannot refrain from enriching my pages with a quotation in which this is described; and which is taken from Bishop South's magnificent sermon on the character of Adam in Paradise. After considering, at some length, the probable extent of his intellectual faculties, the sermon proceeds as follows: "The Will was then ductile, and pliant to all the motions of right reason, it met the dictates of a clarified understanding half way. And the *active informations* of the intellect, filling the *passive reception* of the will, like *form* closing with *matter*, grew actuate into a third and distinct perfection of practice; the understanding and will never disagreed, for the proposals of the one never thwarted the inclinations of the other. Yet neither did the will servilely attend upon the understanding, but as a favorite does upon his prince, where the service is privilege and preferment; or as *Solomon's* servants waited upon him, it admired its wisdom, and heard its prudent dictates and counsels, both the direction and the reward of its obedience. It is indeed the nature of this faculty to follow a superior guide, to be drawn by the intellect; but then it was drawn as a triumphal chariot, which at the same time both *follows* and *triumphs*; while it obeyed this, it commanded the other faculties. It was subordinate, not enslaved, to the understanding; not as a servant to a master, but as a queen to her king, who both acknowledges a subjection and yet retains a majesty."

sation; and to the overwhelming preponderance, which, in any just scale of motives, must be assigned to the conditions of a future state. Ideas opposed, as these are, to the natural inclinations of humanity, cannot be kept before the mind, in adult age, without active volitional effort; nor in childhood, unless gently and repeatedly suggested. Watchful perseverance in this matter is a chief element in that "training" insisted upon in Scripture; and it is the necessity for a *continued* influence, that causes the so-called religious education of a National or Sunday school to be of such little value to the community. A lesson or a precept passes from the thoughts, and is forgotten at the time of trial; unless there be some one to recall it, not in a harsh and repulsive manner, but so that it may soothe irritation, or mitigate distress. The thoughts which may be thus habitually suggested, and artificially retained before the consciousness, will form, in time, so many links of association with the events of life, that they will be spontaneously presented at the proper seasons; and, as their utility is more and more experienced, the volition will be more and more active in causing their recall; until, at length, they will furnish a standard, by which the quality of all others may be tried.

It remains to notice an opinion which has been actively promulgated with regard to submission in its religious aspect; and to the relation that should subsist between the Human Will, and the Divine. A certain religious party have, in their written and oral teaching, represented submission or subjugation of the Will to be a cardinal virtue, for the

attainment of which all Christians should strive ; and they have, some of them, carried this doctrine to a length which would greatly curtail the limits of moral responsibility. The author has no desire to impugn the sincerity of these persons ; but he cannot believe them to have bestowed that attention upon the subject which alone could qualify them to teach concerning it : and he is most thoroughly convinced that an attempt at the renunciation, or abnegation, of the Human Will is a kind of self-degradation, subversive of the order of nature, and expressive of little thankfulness for the bounty of Providence. He believes, too, that the *idea* of unqualified submission to the Divine Will has been commonly, so perverted in practice, as to produce no better result than an indolent fatalism ; and that it has been found, in fact, by removing many of the established landmarks of morality, to surrender the animal man to the guidance of his passions ; or (what is the same thing) to the passions of others, if suggested to him through a certain channel. For the Divine Will can only be recognized through events, or through revelation ; the former being frequently the direct results of human conduct ; the latter being sometimes doubtful or obscure. Either must receive careful study before its signification can be ascertained ; and hence, on the principle of submission, it is, in reality, the instructor who obtains dominion ; by his interpretation of natural phenomena, or by his explanation of Scriptural teaching : the devotee, like the Israelites before Mount Sinai, not only neglecting his own privilege and duty, but surrendering his treasures to the priest, and

worshipping the Calf that is given to him as their substitute.

The subject of Volition, in its chief modes of exercise, has been most ably, clearly, and concisely handled, by Dr. Carpenter, in the work so often quoted, or referred to, in these pages. It is there shown to be “by the *assimilation*, rather than by the *subjugation*, of the Human Will to the Divine, that man is really lifted towards God;”¹ and there much information, of the greatest practical value, may be found. The author had originally intended to treat this subject himself at greater length; but has refrained from doing so, in acknowledgment of the previous labour of a master-hand.

¹ ‘Principles of Human Physiology,’ 4th edition, p. 850.

CHAPTER II.

THE REGULATION OF THE PASSIONS AND FEELINGS.

THE subject of the present chapter must necessarily offer itself to the mind under a twofold aspect: having reference, in the first place, to the period of early childhood, when the control of the feelings can only be accomplished by external suasion or coercion; and, in the second, to the time of life which brings them under the government of the individual.

The first division will not require more than a cursory notice, it being chiefly necessary to remark, that, in many cases, fits of childish anger may be prevented by management. It is impossible to avoid noticing the admirable tact that is exhibited by some parents, and the dexterity with which they draw away their children from dangerous ground; while others, from want either of judgment, or of knowledge, seem almost to solicit misbehaviour. If it were once understood that the physical effect of anger is always injurious, and that each outbreak produces increased liability to others, more care would commonly be taken with regard to them; and the collisions which so frequently happen in some families would, to a

certain degree, be obviated. When they have been suffered to commence, and when the will of the child is fairly set in opposition to that of the parent, it is necessary, as a rule, for the latter to enforce obedience; but an endeavour should always be made to prevent such conflicts from occurring, more especially during a season of irritability, or fretfulness, in which the risk of them might be imminent.

The word management, however, must not be interpreted to mean indulgence; because it is obvious that the power to indulge would be exhausted sooner than the desires of the child, and that a time would arrive beyond which the system could not be continued. The aim should be, from a very tender age, to accustom an infant to act upon external suggestion, so that, if ailing or peevish, it should still find amusement in the things offered to it, rather than in the pursuit of its own objects; from which it should frequently be diverted, but never forced, except when they are dangerous or improper. The injurious emotions of early life are few in number; fear, anger, and jealousy, almost completing the tale; and therefore, by the exercise of discernment, it would often be easy to prevent the operation of their exciting causes. A young child, whether ailing or not, should *never* be left in the dark, and never alone, when it is possible to avoid doing so; while one who is naturally excitable, or easily terrified, should always, upon awaking, find a familiar face at hand. Objects that occasion alarm, or distress of any kind, should be kept scrupulously out of sight until the association

connected with them is broken through: occasions of anger should be avoided; and the strictest impartiality should regulate the government of the nursery. These precepts are practised, as it were, instinctively, by some mothers and nurses; while there are others who find it impossible to enter into their spirit, or to fulfil their letter. But the immediate contrast presented by children under the opposite methods of control, as well as the more remote, but no less certain effects which may be traced to them in after life, afford an unmistakeable lesson to those who will observe the facts on which it rests. The teaching of Nature can never be neglected with impunity; and children whose parents have been exposed to all the conditions of high civilization, to its luxuries and to its cares, are born with an impressibility, and tenderness, of the nervous system that render them, with regard to all such influences as those which have been pointed out, far more delicate than others.

A certain amount of care will be required, lest, in striving to preserve children from emotional excitement, the very ideas to be excluded should absolutely be suggested by the process. The precautions that are taken must not be talked about, nor ostentatiously displayed, but quietly acted upon; no hint of their purpose being suffered to transpire. A child who heard that he was never to be left alone, nor in the dark, and that a certain animal or thing was to be rigorously excluded from his nursery on his account, would be likely to have all manner of indefinite fears aroused in his mind, and attached to the state or object in question: while, if he had ever been fright-

ened by it in reality, the association of terror would be strengthened by attention, instead of becoming gradually weaker, and being at last forgotten. It is obvious that emotions should never be designedly suggested, except in connexion with fire, cutting instruments, or other common sources of positive danger. The two examples given will never become objects of terror; and the most that can be done is to invest their familiarity with a salutary idea of caution. But the bugbears with which children are sometimes threatened occasion fears of a very different kind, and have destroyed the health or the intellect of many; insomuch that it would be difficult, in any case where their employment was detected, to name a limit for the evils that might ensue.

Towards the close of the period of infancy, and in a more marked degree as time pursues its course, the emotions that are experienced will admit of a general division into three classes: those of the first being simply pleasurable, and devoid of any striking moral aspect: of the second, sympathetic, benevolent, or virtuous; and of the third, selfish or vicious, in their character.

The emotions of the first kind may be illustrated by the gratification which children experience at the recognition of a familiar face, or other object, which recalls past pleasures to their remembrance. Such feelings are commonly permitted to have full and immediate outlet in action; they are seldom violent in degree; and, as far as health is concerned, they require no notice, their effects (if any are produced) being beneficial, and exerting a tonic or stimulating influence upon the system.

The second class will include nearly all the feelings by which human nature is elevated and ennobled, as long as their display is controlled by the exercise of sound judgment ; but which, in many cases, become sources of weakness or of folly, because permitted to attain an inordinate development. To these, therefore, the attention of the educator should be earnestly and steadily directed; sometimes to encourage, sometimes to balance, and often, perhaps, to restrain them. As they require, so, in the majority of instances, they will abundantly reward, his care ; and they will justify, during the growth of character, far more anxiety than those of the third class, which may be kept within bounds by a smaller exertion of skill and patience ; or which, if neglected by the parent, are more easily subdued by the discipline of the world.

The emotions that seem praiseworthy, and that do not require to be absolutely restrained, will be developed, in the first instance, in a form and intensity corresponding to the immature judgment, and imperfect knowledge, of the child ; and it must necessarily be a work of time, and of experience, to remodel them in these particulars. Whilst the time is being given, and the experience is being gained, it should be remembered that it is the purpose of the emotional state to produce action ; that, unless this purpose be fulfilled, the body is liable to suffer ; and that if, during childhood, a feeling be allowed to expend itself in words, they are likely to supply its customary outlet, and to destroy the real influence upon conduct which, otherwise, it might have exerted. Hence, emotions of generosity or benevolence should be permitted to

display themselves, in the conduct of the young, in proportion to their means and opportunities ; the parent watching the course of events, and only interfering to check manifest absurdity, or to prevent too great a disappointment. By this means, the feelings of children will follow their natural courses ; and will bring experience, not only of the gratification of indulging them, but also of the cost at which they must be indulged. To learn either lesson singly, or, as too frequently happens, to learn only the first at home, and the second in the hard school of society, has made shipwreck of the happiness of many a pupil ; and has debarred from pleasure the most exquisite, as well as from utility the most assured. To have learnt neither, and to have been limited to talk as a substitute for action, are the chief sources of that sickly philanthropy which bewails unreal or irremediable troubles ; but which can stir no finger for the aid of those who have dragged their weary burdens to its very door. In the direction of *right* feelings, the office of the parent should be strictly that of a counsellor : the state of childhood being regarded as a state of preparation for the independent activity of the man ; and that education being the best which prepares the most thoroughly. The wisdom of experience must be purchased by every individual for himself ; and the father can only guide his child to the most advantageous market, and limit, in some degree, the price that he will be called upon to pay.

When there is an evident tendency to the predominance of any single emotion, so that, if unchecked, it would probably become a marked feature of the

character, and a leading principle of the conduct, such one-sided growth should be restrained by directing attention towards ideas opposed to it. It is probable that the bent of the disposition will soon cause something to be done that may serve as an example, or caution, for the future: some whistle to be bought too dearly, or some trouble to be narrowly escaped. This, if employed judiciously, will often suffice to suggest prudence to the hasty, or to urge forward the unduly timid; but it should not be revived too frequently, or converted into an annoyance when it should serve as a warning. No one will readily follow advice that produces irritation; and persons constantly act in opposition to direct, but unpalatable, counsel, when a suggestion would have sunk into their minds, and would have excited ideas in unison with its tendency. In these respects, as in most others, "the boy is but the father of the man;" and the conduct of children will shadow forth that of the larger world beyond their sphere, with an exactness which those about them often fail to appreciate correctly. The necessary interference with their better feelings and desires should be effected, therefore, mainly by the aid of suggestion: this being more or less pointed, more or less frequently repeated, according to the circumstances of the case. The mind should be furnished with additional evidence in support of a right conclusion; but should seldom have this conclusion thrust upon it by authority.

The actual strength of the emotion that is aroused, must, in every case, be thoroughly considered; as well as the tenacity or fickleness of the character; and

whenever it is necessary to restrain the natural operation of a feeling that has been strongly called forth, or that is likely to sink deeply into the mind, the aid of muscular exertion should be employed, in order to carry off the superfluous nervous force. The action selected for this purpose should, in general, be somewhat energetic; but it is of more importance that it should engage the attention, as well as the limbs. The employment of either would accomplish the end that is in view; but, when they work together, neither is required to work with so much energy.¹

Passions that are vicious or degrading should be treated in a manner similar to that advised for those of more exalted kind, when manifested in excess; but with the reservation that the opposite view should be most strongly pressed upon, and retained before, the attention; that improper conduct should not only be prohibited, but prevented; and that the imprisoned force should be directed upon the muscles, with as

¹ The author cannot refrain from relating an amusing illustration of the text, furnished by the conduct of a little boy with whom he was well acquainted, and whose temper was somewhat liable to be disturbed. The young gentleman once went upstairs, immediately after a violent fit of anger, in order to remove all traces of that condition before sitting down to dinner with some guests. It is probable that he found a balm in the performance of the duties of the toilet; for, on all subsequent occasions of excitement, he obtained relief by dint of attention to his *hair*, which was first vigorously brushed, and then most carefully arranged. He was by no means a dandy under ordinary circumstances; and hence this paroxysmal neatness attracted the notice of his family, who were accustomed to say: "Some one must have offended Johnny: Look at his head!"

little delay as possible. If all this were done, early and systematically, as it might be in most cases, the evil would speedily be overcome; and, whatever mischief might arise from the feelings which require restraint and encouragement by turns, and the relative intensity of which must often be determined by casual events, still the absolutely vicious propensities might be expected to disappear. Requiring no judgment to determine the extent to which they should be tolerated, and receiving no quarter when their existence became known, it would be almost impossible for them to survive, as active, or even recognizable, elements of character.

There will often be some difficulty in determining the exact nature, or place, of the feeling by which a child's conduct is dictated; and in deciding, among several evident motives, which of them has been predominant. This problem can only be solved correctly by constant reference to the peculiarities of the case, and the general balance of the disposition; and moreover, the degree in which an emotion is displayed must be known, before any place in a moral scale can be assigned to it. There are, however, certain general considerations, attaching to certain classes of feelings (classes arranged without reference to excellence or depravity, but solely from resemblance in the nature of the principal idea); and these considerations it may be useful briefly to examine. In every case, the legitimate or natural effect of the emotion at issue should be compared with its actual operation upon society as at present constituted; and

some general idea as to its treatment gathered from the results of the comparison.

The first class of feelings to which this test should be applied, is the *Religious*: the most universal, and probably the most powerful, of any that actuate the human race. To assign to them an exact office, or natural mode of operation, is a task not devoid of difficulty, in consequence of the diversity of opinion that prevails upon the subject; but the author's individual belief is that they are intended to produce inquiry, or a search after knowledge, with regard to the revealed Will of the Creator to whose existence they point; and with regard to the best means of fulfilling its requirements. He thinks it will be found, wherever they have been permitted to act directly upon the body, without the intervention of such inquiry, that excesses opposed to the spirit of true religion have been the result; as displayed in persecutions of various kinds; in violent effects upon the bodily health;¹ or in a peculiar form of pseudo-devotional self-consciousness, which has become exceedingly familiar to medical practitioners during the last few years. Upon this view of the case, they should by no means be encouraged indiscriminately: the practice of many conscientious people with regard to them being such as to call for reformation; and tending to produce extravagance, when right conduct would never transgress the barriers of sobriety.

It can scarcely be doubted, that, if a young person be encouraged to dwell upon religious *feelings*, as

¹ See page 198.

such, and be not taught to direct them into a single channel, or to examine them by an unalterable standard, they will acquire a very considerable predominance over all others; and, at the same time, will fail to produce any definite rule of life. In this condition, an external suggestion, however absurd, or however opposed to scriptural teaching, will, if conveyed to the mind in a striking manner, engage for its realisation the whole of that emotional force which, gradually and imperceptibly increasing for months or years, has at last usurped the authority of the will. The nature of the result will depend upon the character of the suggestion. Among the sectarian bodies whose devotion is expressed by dancing, posturing, or other violent movements, these movements will be produced. Among those who love to talk of retirement from the world, and who accept rest under direction as their dominant idea, the attention will be more affected than the muscular system. They will occupy many of their waking hours in thinking about their own mental sensations; not really scrutinising, but indolently dwelling upon them; and giving the name of self-examination to that which is nothing but self-consciousness. The end of all this is generally calamitous; but must depend much upon individual position, much upon the natural or acquired strength of the emotions concerned. In some cases, where the predominant idea has never been very strongly impressed,—and where it has been speedily relieved or exhausted by energetic action,—a transition to a diametrically opposite state of feeling is not infrequent; and the mind oscillates irregularly, between the several

points of the theological circle. Sometimes, an idea entirely of this world is suggested in the shape of a temptation ; its realization becomes an object of desire ; the feelings are enlisted on its side ; and the human puppet, powerless to struggle against emotions whose ascendancy has idly been permitted, makes some grievous lapse from ordinary morality, and falls, a spectacle to the vulgar, and an occasion for ribaldry to the profane. Often, the continued subjection of the brain to the sway of excited feelings works, at last, some injurious change in its nutrition ; and then another victim is added to the so-called religiously insane. I say so-called, because religion, in the proper sense of the word, can never affect the mind injuriously.

The cause of these evils is to be found in one main error : that is to say, in the belief that religious feeling, as a thing desirable and good in itself, must be good however it be manifested, and whether or not it be controlled. People are apt to ignore the crimes and follies that have been perpetrated in its name ; or to fancy them venial, on account of the source from which they have arisen. But surely this notion involves a grievous departure from the truth ; it being most reasonable to believe that the emotions which prompt to the performance of the highest duties, are those requiring the most watchful care ; and that they are talents, which it would be equally culpable to squander or to conceal. To leave them unrestrained is to be guilty of the first ; and to repress their development, of the second.

Desiring, therefore, to address himself to Christians

of every denomination, and not to transgress the common ground upon which they all may meet, the author would suggest to parents the early and active direction of religious emotions into a practical channel; and that they should be subjected to a diligent scrutiny, at once encouraging and rigid. He would recommend that the standard observances of the day, or of the sect, should not be accepted, without examination, as furnishing in all cases the best mode of activity; but that the effects produced by them should be narrowly observed: the mind rather inclining towards distrust, when estimating the utility of that which is habitual. Such utility would have to be determined, by each parent, not with reference to the public, but to his own family alone; and there would be many particular instances to justify departure from a general rule. Some standard should be taken as to the *design* of religious feelings; and towards this their effects should be made to bend;—with it, whenever possible, to conform. All tendency to indolent reverie, or to visionary and ecstatic excitement; all fanciful flights beyond the limit of human sympathies and duties; all indications of automatic action,—should be watched with anxious and undazzled eyes; and with reference to the question: How will this end? In the same way, errors of judgment, occasioned by religious feeling, but of a nature opposed to religious principle, should be incentives to a re-examination of the road that is pursued. Bigotry, presumption, arrogance, intolerance, all have this origin; although blended, it may be, with no small alloy of ordinary pride and selfishness. Still they are

produced, more or less, by ill-regulated religious emotions; and are valuable, among many other evidences, as affording proof that these emotions cannot implicitly be followed.

It is much to be regretted, on all accounts, that the state of society in this country affords so few facilities to the laity, and especially to young men and women, for directing the emotions under discussion towards works of practical and personal benevolence. It is probable that the want of such opportunities has occasioned many men to repress their best feelings, or to bring them into subjection to the cares of business or the anxieties of life; and many women to suffer, both in health and happiness, from the compulsory inactivity to which they have been condemned. This is not the place in which to consider how the deficiency may be supplied. It is mentioned only as a suggestion; and to show that it may sometimes be desirable to deviate, in a greater or less degree, from the exact fashions and customs of our neighbours.

Next to the Religious emotions, in point of influence upon the body, must be placed those arising out of attachment between individuals of opposite sex; and when it is considered that these, in men, have abundant opportunities for display, through the various actions or attentions which they dictate: while by women all evidence of them is scrupulously concealed, or, as a rule, even their existence denied, it will be manifest that the latter must be the chief sufferers from them, so far as health is concerned. The conclusion thus justified by reasoning, is, it need hardly be said, abundantly supported by experience: attach-

ment, either unrequited, or opposed by insurmountable obstacles, being a frequent source of feminine disorders; and, especially, of disorders of the nervous system. It becomes, therefore, a matter of some importance, to consider how far the mind may be so strengthened by education, as either to resist entirely the injurious operation of the emotions in question, or at least to yield to them in the slightest possible degree.

In conducting this inquiry, it may be conceded that there are numerous instances upon record, in which the disappointment of a strong and sincere psychical attachment has been productive of disastrous consequences, which have followed, by virtue of the principles enunciated in a former chapter. If, however, the ordinary course of events be narrowly observed, it will become apparent that such instances are few in proportion to others, which, bearing some general resemblance to them, are due, nevertheless, to disappointment of a very complicated kind. In analysing the history of a case of hysteria, or mental derangement, or obscure disorder of the general health, arising, as it is said, from disappointed affection, it will usually be found that real attachment has formed but a small portion of the emotional structure. The desire to escape from the control or the circumstances of home; or to possess the liberty and the greater social importance of the married state; the fear of the remarks or the ridicule of society; the pangs of wounded pride or vanity; and, sometimes, the sense of positive injustice,—all these feelings, as they are respectively disappointed or aroused, may combine to produce the

general result. They contribute largely, in the majority of instances, to the causation of disease; and they are probably amenable to judicious management, in the same degree as if otherwise excited. As a practical hint it may be mentioned, that, in any instance of disappointed attachment, these lower feelings should be suggested to the mind; and, if their existence be revealed by the ready vibration of the chord that is struck, the case should be considered as requiring moral discipline, rather than the pleasures of change of scene and of compassion.

The natural history, so to speak, of the purely psychical element of affection, is so little studied or understood, that conjecture must furnish the basis of its treatment, except in so far as it has been already taught by experience. The removal, as much as possible, of objects or persons likely to recall it to the mind, and the occupation of the thoughts upon matters which shall preclude reverie; if not including all that can be done, will at least include the chief matters of importance; and the benefit derived from these proceedings will be sufficiently suggestive of the further measures that any particular case may require.

Those, however, which have been collectively denominated the lower feelings, although not always curable, might always be prevented from gaining an improper ascendancy; but this object can only be attained by judicious guidance in early life. Girls trained to esteem that which is truly estimable, to seek for happiness where alone it is to be found, and to hold the feelings in subjection to the intellect and

the will, so that the restraint of the latter is not withdrawn unless the former can sanction its withdrawal;—girls educated thus are little likely to bestow their affections upon unworthy objects, or where a requital is either improbable or unsuitable; and they are less likely still to sink into disease or inutility under those afflictions, often so severe, which are brought, by the events of life, to many, and may, perhaps, be brought to all. But the precepts of a selfish or worldly mother, or the gossip of idle, silly, and frivolous companions,—while they leave little capacity for a disinterested affection,—entail manifold chances of bitter disappointment, and furnish no balm in the hour of sorrow, no strength against the time of trial. That time finds only a defeated speculator, the cherished aim of whose life has been untrue. Can it excite surprise that, sometimes, baffled, enraged, disappointed, she should have neither the cunning nor the energy for continued scheming? Her motives, if not in the direct sense venal, would have borne to true affection a relation analogous to that which the wish to conform to worldly usage, the desire to be thought religious and respectable, and a sense of the advantages of adhesion to a party, bear to true devotion. Producing results that, in a superficial sense, are similar, the semblance does not afford the same benefit as the reality, and is exposed to disasters from which the reality is exempt.

The Emotions whose general results are expressed by the word *Temper*, although they do not often produce any sudden effect upon the health, are universally known to influence it, by their continued

operation, in a very remarkable and powerful manner. They contribute, too, so largely to the happiness or misery of domestic life, that their social reacts upon their sanitary importance; and the two combine together, to give them a prominent place among matters requiring the attention of the educator.

The prevailing temper of any individual will depend, in the main, upon his estimate of the actual or relative importance of the smaller events of life; and upon the idea that he forms of the motives which actuate the persons by whom he is surrounded. These two elements may be modified to almost any extent, by the aid of observation and reflection; and the temper which they constitute may be modified with them. It is obvious that the generality of people will be provoked most easily by an offence conveyed through the sensation to which they habitually attend: the gourmand, for instance, by defective cookery; the notable housewife, by untidiness or disorder. And, as education enlarges the mind, and increases the number of objects offered to its contemplation, so it diverts from unreasonable attachment to any single class of sensory impressions, or to any arbitrary rule of conduct: permitting an interruption of the one, or a departure from the other; and not associating annoyance with the change.

Under less favorable circumstances, when, from prejudice or narrow-mindedness, any deviation from accustomed usage is viewed with suspicion bordering upon resentment, much will depend upon the motives that are ascribed to the person by whom the change is wrought; and here, again, mental discipline may

ulfil a most important office. For it is said, perhaps with perfect truth, and certainly with a near approach to it, that the motives we assign to others are but the reflection of our internal consciousness; and that no one can imagine any motive, or think of it as a spring of action, except after individual experience of its operation. Undoubtedly all men look first into their own hearts, when they wish to explain the conduct of their neighbours; and he who judges harshly of another, does but furnish a clue to the (possibly unsuspected) vices of his own character. Hence, it is proverbial that good men are charitable, and knaves suspicious; as well as that cowards, accustomed to be governed by their fears, strive to excite terror in those whom they would control.¹

It may, therefore, be concluded that education, in so far as it has the power to bring and retain right motives before the mind, and to extend knowledge beyond the narrow sphere of individual habits, will exert a very marked influence upon the temper. The good man differs from the bad, in the readiness with which he believes that the occurrence that is disagreeable to him has arisen from accident, or even from good intentions; and not from culpable carelessness, or from a desire to annoy. The man of the world differs from the recluse, in the readiness with which he accommodates himself to a departure from routine, and in his backwardness to perceive, in such departure, any just cause of offence. Perfectly good

¹ For this illustration the writer is indebted to an essay by Mr. Robert Chambers, published in his collected works.

temper can only be produced by a rare combination of moral excellence with worldly wisdom ; but temper sufficient for the ordinary demands of society, may be due to either source alone. The first, however, will graft it upon principles of universal application, and will carry it into all the relations of life ; while the second is apt to become so intimately blended with considerations of fear and interest, as to be inoperative where these relax their hold. Hence, so many persons are found who are obsequious to their clients or employers, and courteous to their friends ; but harsh and tyrannical in their homes, and ruffianly or oppressive to their dependants.

The degree in which temper may be governed, and the degradation of submitting to its yoke, are points upon which there is much want of knowledge among the public : a want depending upon various causes. Most unfortunately, ill temper can scarcely ever be displayed, except to inferiors ; and hence it is an evil which does not affect the surface of society. Its influence is almost confined to home, it is a vice in which those delight who practise it ; and, as their equals are not inconvenienced, public opinion has scarcely pronounced it to be disgraceful. The advantages of good temper, however, are so unmistakeably evident, that an ingenious superstition has been devised, intended to do honour to its possessors, without censuring their opposites. It has become customary to speak of temper as a quality or peculiarity beyond the control of the individual, like the colour of the eyes, or the conformation of the body ; and to regard

those who yield to its least agreeable impulses, as if they were unfortunate in some special sense, and in a greater degree than the slaves to any other vicious indulgence. Such language, evidently intended to convey flattery to the good, and to avoid the condemnation of the bad, has produced its natural effect upon society; leading to an indolent acquiescence on the part of those who do not care to examine for themselves. It constantly causes people to overlook, in their children, faults which they should strive to conquer; and it is, sometimes, a source of self-deception. We hear, "it is his temper," or, "I cannot help my temper," often as excuses of which the hollowness is well known to the speaker; and, now and then, perhaps, uttered in sober earnestness. The persons who do not recognize their own power of resistance, must be expected to yield without a struggle to the pressure of their "infirmity;" and to become, in process of time, a burden to themselves, and a nuisance to all around them. Judging from his own observation, the writer is inclined to think that uncontrolled ill temper is most frequent among those who make great external profession of religion: with whom it is, perhaps, a sort of unconscious compensation for self denial of other kinds.

As the reverse of wrong is not always right, so there may be an absence of ill temper depending upon causes that afford no ground for commendation. Easiness or apathy of disposition, or dullness to sensorial impressions, or the casual avoidance of the right exciting cause, may keep the peace for a certain time,

even under apparent provocation ; but they will only serve to avert suspicion from a weakness that may be real, even though it be dormant.

The passion of Fear, almost absent in some children, and morbidly exaggerated in others, would appear to be that which admits of the greatest inherent or constitutional diversity. It is manifest that the varieties of character must be due, in some measure, to natural differences in the balance and relative intensity of the emotions ; although these conditions may probably be much modified, or even reversed, by the events of early life. For instance, an infant who had been terrified in the cradle would be likely to grow into a timid child ; although, if nothing had befallen it, the character might have been precisely opposite. Extreme timidity will always justify suspicion of an unknown cause of habitual fear ; and should lead to a most minute inquiry into all the circumstances of nursery management. Some children are often left under the guardianship of a bugbear ; and are in such terror with respect to it, that the truth can only be elicited by patient and skilful questioning. But whether there be any special cause for them or not, the emotions of fear should be avoided in every possible way ; and no appeal should be made to the reason, unless at an age when its powers are well developed. Whatever arguments have been used to convince a young child of his safety, he will be likely, if brought into collision with the source of affright, to trust more to his feelings than his intellect ; and so decided a victory, on the side of the emotion, would most powerfully increase its sway.

With regard to all the feelings, the educational process that is commenced by the parent, must, as time allows, be continued by the child; who will have been taught the way to exercise self-control, and should be called upon to put the lessons into practice:—receiving, gradually, less and less assistance from suggestion. At first, it will be necessary to describe distinctly the ideas that are most suitable to the circumstances, as, for instance, in endeavouring to supersede anger by a sense of the duty of forgiveness. Afterwards, the slightest allusion may be sufficient; but much will always depend upon the disposition and intellectual character of the child; and success can only be obtained by careful observation of these important features, and by shaping example and precept in harmony with the teachings of experience.

There is not much to be said about the treatment immediately required by the different kinds of emotional excitement:—the degree in which a passion is aroused, and the time at which some adventitious outlet should be sought for it, being always questions of greater importance than its precise nature. But, as excessive passion is nearly always based upon a mistaken or exaggerated notion, the habit of forming precise ideas will greatly check the emotional tendency; and the causes of anger or of fear will frequently dwindle into insignificance before the eye of reason. They do so, in most cases, when the outbreak is over; and it should be an aim in education to reverse the order of the process, and to adapt the strength of the feeling to the real extent of the provocation. Until, however, the reasoning faculty has

been exercised during calmer moments, it cannot be relied upon as a bridle to the force of passion ; and at first, or until a certain discretion has been attained, it will be the safest course to divert the thoughts from causes of excitement, while every endeavour is made to obtain active volitional exertion. During the whole period of youth, while more and more power of self-control is gradually being obtained, and sometimes even in adult age, such active exertion will be found an invaluable adjunct to the force of will ; and its utility cannot be too widely published. It will be most serviceable when least monotonous, and when constantly requiring the attention of the mind : that is to say, when it cannot be delegated to the inferior nervous centres, leaving to the brain an opportunity for reverie. On purely speculative grounds, it may be believed that intellectual work would be of equal value with physical ; but, as a matter of fact, there is seldom the same command over the mental faculties, as over the bodily movements. A man whose power of abstraction permitted him to turn to a philosophical inquiry, as a resource against feelings which he was determined to control, would not only be possessed of the very highest order of mind, but would be likely to take so calm and just a view of the affairs of this fleeting world, that he would seldom find cause for the exercise of such a rare dominion. Like the hypothetical Adam before referred to—"caring not for the things which he saw, he would care still less for those which he saw *through*."

There is, however, one form of mental attention which should be within the power of all persons, in

a degree sufficient to exhaust any slight emotion: namely, the exercise of memory. The most ready method of rendering it available is by the recall and recitation of something that has formerly been learnt: poetry, from its rhythm and cadence, being generally preferable to prose. By a greater effort of will, new matter will be acquired; as the successive ideas of the composition, being presented directly to the mind through the medium of the eye, will have a much stronger hold upon the attention than if only connected by an intellectual process. But that which is already known can scarcely be said to require continued volition for its recall: the ideas being linked together by associations of time and place, so that, after the effort to commence, they follow in their order almost of necessity. Moreover, they have this advantage over habitual bodily movements, that, employing the brain, they do not allow it to be engaged by the feelings; and they thus strike the emotion at its very root. Children who are inclined to be passionate, but who evince a desire to curb themselves, should be taught this use of memory; and, whenever anger is impending, the remedy should be suggested to them. Unless the suggestion come too late, they will usually be glad to act upon it.

In conclusion, it may be remarked, that the passions and feelings of the child cannot be usefully controlled by the parent, during the period of infancy, nor by itself, at more advanced age, except through a correct estimate of their nature, combination, and tendencies; and with continued reference to the progress of mental and bodily development. It is obviously impossible

to lay down precise rules concerning quantities liable to constant fluctuation ; and whose very nature renders them undefinable by words. Where or what to repress, where or what to encourage, are questions that can only be answered by a knowledge of the whole character, and of the circumstances that are brought to bear upon it. They require special study, not only in every house, but with regard to every individual ; and upon their right solution will depend all graces of character that are not inherent, except in so far as the events of life may supply the deficiencies of education. It is the object of these pages to teach the injury that uncontrolled emotions may produce ; to point out how the mind should be diverted from the ideas that enter into them ; and how their force may be harmlessly expended : but the times and seasons at which these precepts should be practised must be determined by those alone upon whom alone the duty of training is imposed. With parents, in the majority of instances, must rest the chief opportunities of doing good ; and with parents, also, must rest the responsibility of neglecting them.

CHAPTER III.

THE REGULATION OF THE STUDIES AND ACCOMPLISHMENTS.

THE studies and accomplishments by which the powers of the mind are to be developed, and afterwards to be displayed, form a highly important element in every system of education. By some persons, indeed, they have been raised to a position of unnatural prominence; and it is probable that, generally speaking, they command greater attention than is their due. But the glitter of superficial acquirements receives, too frequently, more of homage than of correct appreciation; and, so long as this is the case, mere knowledge is likely to be admired and sought after, to the neglect of that real mastery over intellect and temper which, nevertheless, must determine the place of individuals amid the competitions of society. In order, therefore, to estimate studies at their proper value, it is necessary to consider what purposes they are calculated to fulfil; in what manner they may be most judiciously employed; and what practical distinctions may be drawn between their several varieties.

With regard to the first of these questions, it will, I apprehend, be universally admitted, that the primary

intention of study should be the improvement of the mind itself; and that the second should be the acquisition of some special knowledge, to be applied to purposes of utility in the world. Knowledge, we hear it said, is power; but power improperly directed is unavailing, or often mischievous; and, not unfrequently, recoils upon its possessor. By a more accurate simile, knowledge may be likened to the raw material of the manufacturer, which, when placed in untaught hands, is left to perish unprofitably; although, by the skilful workman, it may be wrought into beautiful and useful fabrics. Facts, in themselves, possess but little value; and should only be esteemed on account of the conclusions to be drawn from them: a lesson that may be illustrated by the manner in which people of information rush headlong into all sorts of delusions and absurdities; as well as by the facility with which a person of cultivated intellect can always find the materials for thought, scattered about his path in rich profusion. Hence, the training of the judgment, and the culture of the powers of observation and reflection, should, in all cases, be the first objects of the educator: generally the first in point of importance; and always in point of time. Acquirements may be mastered at any age; but habits of inattention, or of inexact thinking, founded in early childhood, cast their shadow over each successive epoch of life; and exert an equally pernicious influence at its commencement and at its close. It is not too much to say, that, in modern procedure, these great truths are commonly disregarded or forgotten; and that, even when remembered,

they are often not carried into practice, however distinctly recognized in theory.

Shortly after commencing to write these pages, I questioned a very intelligent clergyman, who personally superintended the lessons of his children, with regard to the objects which he proposed to himself in his work; and his replies appeared to furnish a fair expression of views that are generally entertained. I inquired particularly, with what intention he taught his boys Latin; and he said that, in doing so, his chief aim was to develope their intellectual faculties. He regarded a sentence to be construed in the light of a problem, which called forth the energies of the mind for its solution; and he conceived, that a daily repetition of this exercise must be eminently favorable to the growth of memory and judgment. Without absolutely denying the truth of his position, it may still be argued that the faculties in question are of sufficient importance to justify the occupation of time in systematic endeavours to improve them; and that they should not be left to the casual operation of studies possessing no intrinsic value, and none but an accidental relation to their assigned purpose. If it were intended to prepare a child for some physical contest, as, for instance, a race, care would be taken to give him all the advantages of training, and to cultivate, especially, that qualification for success, whether speed, endurance, or breath, in which his early trials showed him to be deficient. No one would be content with directing him to run on as many errands as possible for his neighbours; or with merely hastening his ordinary movements; although either plan, in so far as

it had any effect at all, would conduce to fleetness of foot. But methods analogous to these are constantly trusted, as if affording a sufficient preparation for the intellectual race of the world; and many parents are satisfied with mediocrity, provided that it has followed a strict adherence to routine. Certain books have been read, certain tasks accomplished, certain lessons learned over and over again, the regulation quantity of mental food has been swallowed, and its digestion is left to nature. The children themselves, who stuff young nestlings to the throat with a quill, do not display more total indifference concerning the quality or fitness of what they give; or more simple wonder, when their captives perish by starvation in the midst of plenty. Indeed, from the nature and tendency of many prevailing customs, it might be supposed that the operations of the mind are instinctive; and performed correctly of necessity, whenever certain conditions are applied. That its use requires to be studied, and that the best precepts cannot supersede the necessity for diligent practice, is so little known or recognized by the generality of persons, that the advantages to be expected from mental education may even appear hypothetical, from want of familiar examples in which they may be shown. But, nevertheless, there are certain signs of the times, which seem to indicate the approach of a better future; and there is a growing tendency among men of education to claim the position to which they are entitled, and to demonstrate that, although the masses have ceased to be illiterate, they have not learned to be philosophical. The remarkable cheapening of literature

within the last few years, the general diffusion of rudimentary treatises upon various branches of knowledge, and, especially, the continual publication of the last achievements of scientific inquiry in that condensed, facile, and accessible form which has been cleverly said to "run through the heads of ordinary readers, like water through a tin pipe, leaving them as empty as it found them:" all these circumstances have combined to exalt the current value of information; and to divert the attention of the public from those qualities of mind, by which alone information can be fruitfully employed. Like the members of Christ Church, who, in Bentley's time, "fancied themselves Scaligers," many a reader now rises from an encyclopædic essay, and fancies himself a chemist or a physiologist, in the same sense as the author whose work he has perused. Hence, grave churchmen argue from prophecy to the satanic origin of mesmeric imposture, or to the divine nature of the homœopathic quackery; and lawyers appeal to "common sense" in support of their views upon table-turning or electrobiology. Perhaps it is not chimerical to hope,—after the salutary reaction which is probably impending, and after the public has recovered from the mental intoxication dependent upon a sudden and premature indulgence in the waters of science,—that a more just and rational estimate may be formed of the difference between the producers, and the mere consumers, of knowledge. That this difference will ever again be fully and generally realised, is probably too much to expect; but a conviction may be spread that the mastery of any subject can only be gained by time

and labour; and that such mastery is required, in order to give security against error even in the most trivial details.

Returning from this digression, it is necessary, in order to justify some of the strictures contained in it, to point out the manner in which common methods of tuition fall short of the standard to which they might be raised. For this purpose, the ordinary practice of schools can alone be cited, inasmuch as the routine of domestic education may be infinitely varied in different families; and there is no conceivable common measure by which it can be correctly represented.

The ordinary system of school instruction is often said to be that which produces the best general results, in dealing with masses of children. Its advocates, so far as I have conversed with them, advance this plea only in its favour: admitting that it cannot do the utmost for any single pupil; but saying that, when the necessary economy of the time and labour of the teacher is considered, it does the utmost, as compared with hypothetical systems, for the whole body. This point cannot be conceded without some farther examination; or without a comparison of the effects actually witnessed, with those which might be expected or desired.

In the schools for boys, where the course of instruction is limited to the dead languages, its simplicity greatly facilitates the formation of a correct estimate of its merits. It is usual for the pupils to commit the grammar to memory, learning it by heart as often as may be needed; and to perform exercises of composition and translation, with continual reference to

the rules of syntax and prosody which they are supposed to have acquired. This kind of work is continued for several years, commonly for eight or ten; until, when a certain time has elapsed, or a certain proficiency has been attained, the school is abandoned for an university.

Perhaps it is the most striking feature of this system, that, from the limited course of study pursued, and from the great length of time over which it is extended, the boys must necessarily be employed in traversing the same ground again and again; and, in order to learn it once more, must frequently forget what they have learned already. If the same, or virtually the same lesson be committed to memory nine times in as many years, it follows that, until the last occasion, it can never have been studied as an acquirement, but only as an intellectual exercise; and therefore a correct estimate of its value must depend upon its utility for this latter purpose, and not at all upon its importance as a thing worth knowing.

Keeping this conclusion in view, and going through the course of study *seriatim*, it may be said, in the first place, that the rules of grammar, regarded as an exercise of memory, deserve only a very humble position. In the way they are commonly taught, their simple meaning is seldom understood by the learner; and they are nothing but strings of words, often possessing a certain rhythm, which, for a short period of time, and through associations of sound alone, greatly facilitates the recollection of them. When thus learned, they gain no permanent hold of the memory; and are not at all associated with the modes of

expression to which they refer, but only with the actual jingle of the words that form them. Take, for example, the rules of Latin syntax which relate to the use of the dative case after the verb. These, for the most part, are exceedingly easy to learn as a lesson; and indeed, when once read over, could scarcely be lost immediately. In a few days, however, the associations which connect them become confused together, and they are forgotten, or imperfectly recollected, almost as a consequence of the facility with which they may be acquired. It is obvious that they can never engage the attention sufficiently to strengthen it by exercise; and that, during the short time they are remembered, they will have a tendency to impair, rather than to improve, the memory, by rendering it dependent upon arbitrary or unnatural associations. The power of recollecting nonsense, although remarkable as a kind of intellectual trick, is utterly worthless as an attainment; and should not be confounded with that really valuable memory which rests upon causation or resemblance, and which affords ready access to stores of classified information. Dates, numbers, and the order of succession among the events of history, may be retained easily by the use of any mnemonic system; and the faculty of mere arbitrary recollection, together with the unintelligible lessons which minister to it, should, as far as possible, be discouraged. Its necessary effect is to diminish the power of reasoning, and to convert the order of the thoughts into nonsense, by encouraging the intrusion of irrelevant ideas; so that a spontaneous train of reflection would require scrutiny, and careful weed-

ing, before it could be committed either to speech or paper.

Exercises of composition and translation, although highly useful under judicious management, are open to many objections, either of principle, or with regard to the ordinary manner of their employment. Composition, in a language that is imperfectly understood, substitutes the inevitable mistakes of the learner for the pure style that should alone be studied; and involves a waste of time, and a confusion of error with correctness, as far as the acquisition of the idiom is concerned, for which the exercise of judgment and of attention, required by the work, is scarcely a sufficient compensation. And, when composition is limited to verses, not only is its usefulness curtailed, but its evils are increased in a corresponding ratio. The power of verse writing is eminently a natural one, and where it is deficient, the time consumed in waiting for an idea is, to all good purposes, totally thrown away. For the fruitless endeavours do not involve any useful act of attention, or any methodical arrangement of the thoughts; but just idle and aimless puzzling over difficulty; a process from which no benefit can ever accrue.¹ Translation, as a method of learning a lan-

¹ At a large and famous public school there was, some few years ago, a boy named —, then about fifteen years of age, and by no means deficient in ability, but nicknamed, by the master, *Poet* —, on the principle of *lucus, a non lucendo*. Upon one (by no means exceptional) occasion, he had been imprisoned for nine hours, that he might convert a portion of the Book of Psalms into eight Latin verses. At the end of the time the master, entering the room, said, “Poet —, how many verses have you done?” “Half of one, Sir,”

guage, is entitled to a very high position; but its general educational utility is much diminished by the indifference that is shown to the study of real meaning. Children are taught to look upon books as a collection of examples to illustrate syntax; and the intention of the author is often allowed to pass unheeded, while they painfully disentangle the construction of his sentences. Language, to them, is no longer the vehicle of thought, but only a means of conforming to the rules of grammar; and many pupils, after laboriously construing a Latin sentence, would be found destitute of any glimmering of the idea which it was the intention of the writer to convey. Their minds have, it is true, been exercised in some degree; but the result can never be an adequate return for the time and labour expended in the process.

The foregoing observations upon ordinary scholastic education being, it may be argued, of a speculative character, I will proceed to quote accounts of its actual working: selecting—as my authorities—two writers of practical experience, whose views would hardly coincide upon any other question:

The Rev. Sydney Smith, in his essay on ‘Professional Education,’ says: “The present state of classical education cultivates the imagination a great deal too much, and other habits of the mind a great deal too little,—and trains up many young men in a style of *elegant imbecility*, utterly unworthy of the talents with

was the reply. It is hardly necessary to point the moral by referring to the benefits that must have been received by the unfortunate poet, from a recognized “system of education.”

which nature has endowed them,—all the solid and muscular parts of their understanding are left wholly without cultivation,—they hate the pain of thinking, and suspect every man whose boldness and originality call upon him to defend his opinions and prove his assertions.”

The gifted, but most unhappy, author of ‘Shadows of the Clouds,’ gives the following account of the childhood of his hero,—an account dictated, it is said, by all the bitterness of personal experience: “A talent of itself unhealthily precocious was most unwisely pushed forward and encouraged out by everybody; by teachers and schoolmaster, from the vanity of having a little monster to display as their workmanship; by his father, because he was anxious for the success of his children in life, and the quicker they got on the better; they would the sooner assume a position. . . . It had struck no one there might be a mistake about it; although five minutes’ serious talk with the boy, or to have listened to his laugh, would have shown the simplest of them they were but developing a trifling quickness of faculty; that the power which should have gone for the growth of the entire tree was being directed off into a single branch, which was swelling to disproportioned magnitude, while the stem was quietly decaying. . . . As to the character of the entire boy, his temper, disposition, health of tone in heart and mind, all that was presumed. It made no show at school exhibitions, and, at least directly, assumed no form of positive importance as regarded after-life. So this was all left to itself. Of course, if a boy knew half the ‘Iliad’ by heart at ten,

and had construed the 'Odyssey' through at eleven, all other excellences were a matter of course."

In private schools of the first order, and in schools, whether public or private, intended for the children of the trading classes,—the course of study is commonly less limited; an endeavour is made to communicate knowledge that will be useful in life, and many things are taught with more or less discretion and advantage. In such, a great deal will always depend upon the system pursued, upon the numerical proportion between teachers and pupils, and upon the disposition and intellectual character of the former; while, even if these were fixed and definite, it would be a waste of time to notice separately each branch of an extended curriculum. Arithmetic, however, as it is explained in common text-books, may be taken as an example of the recognized methods of teaching; and it affords a fair subject for remark and criticism.

A boy begins the study of arithmetic by learning, and practising, in succession, the rules for the accomplishment of the four simple processes. These rules, if he be able to remember them, and if he understand the hard words which they contain,—the difference between a dividend and a quotient, a multiplicand and a divisor,—will tell him what to do, when he is set to multiply, or to divide. But they do not teach the reason of the various proceedings; and if, as is very likely, his notion of the rule he is to work by is a compound of parts taken from all four, his results are, on the whole, more likely to be remarkable than correct. A child may often be seen bending, in hopeless perplexity, over a besmeared and dirty slate, not

because he has forgotten certain words, but because he never understood their meaning, and does not see their applicability to the case before him. The difficulty removed or overcome, he still, unless by singular good fortune, has learned nothing of the properties of numbers; and although, as he goes on, the simple rules are put in practice so frequently that it would be impossible to forget them; yet they are remembered as rules alone, and are, doubtless, often supposed to be arbitrary, or the result of mere agreement between calculators, instead of being recognized as expressions of the nature of things. Wherever this is the case, the utmost ambition of the pupil will be limited to following them closely; and he will have no inducement to reflect upon their causes, or to trace out the production of their effects.

A few years ago, the writer, being requested by a village clergyman to examine some boys in his parish school, selected arithmetic as the subject of his first questions. The boys most skilled were brought forward by the master, and complacently admitted a knowledge of the ordinary rules, as far as vulgar and decimal fractions. But they were found to be entirely ignorant of numeration; so that, when told to write down numbers from dictation, placing units under units, etc., as for an addition sum, they made wonderful blunders: and showed clearly that they had never understood their lessons, and had never been taught the first principles of their study. The reasons for the more advanced rules were, it is hardly necessary to add, completely hidden from them; and, although they could perform any indicated process with accu-

racy, they neither knew which one to employ for the solution of a new question, nor, even when told, could they always state the case correctly. They had learned by heart a table, showing, among other facts, that twice twelve is twenty-four; but, if the table had said it was forty-two, the boys would have been equally satisfied, and would have carried on the left hand figure in working by rule through a sum. It is probable that results somewhat similar commonly follow the routine method of instruction; and that, in fact, arithmetic is seldom understood, until the matured judgment of adult age is brought to bear upon its operations.

But it is time to turn away from the contemplation of wasted hours and uncultivated talent, in order to see how those hours might be usefully employed—that talent brought fully into play. The chief means for such a purpose must be sought, not in the acquirement of knowledge, but in the daily exercise of the understanding.

Perhaps no one will be inclined to deny, that, if it were possible to educate without cramming the memory with abstract grammatical or arithmetical rules, and without compelling the performance of unintelligible translations, or the composition of nonsense verses—if there were other and efficient methods by which really to develope the faculties of the mind—the acquirements and information wanted in the world might be attained, at a more mature age, with much less time and labour than is commonly bestowed upon them now. Assuming this to be true, I would commence the instruction of children almost entirely by

lessons taken from the book of Nature ; explaining to them the more simple phenomena of life and vegetation, and the elementary facts of science ; exercising their judgment in what they saw and heard, and their memory in its recollection ; and constantly endeavouring to train them in habits of thought, and in the practice of volitional attention. In the course of time, things that it was intended ultimately to teach for their own sakes, should be made auxiliary to the educational process ; but their effects should be carefully observed and regulated, and they should not be forced down by measure, under a gratuitous assumption that the intellect was being nourished. Reasons should be taught, explanations should be given, inquiry should be stimulated and assisted ; and, above all, not a single step should be taken without full assurance that the lesson last learnt was clearly understood. No trouble should be too great, no time too long, to be spent in the attainment of this essential point ; it being remembered that a thing once comprehended in its principles, by the very structure of the mind, can never be forgotten. The knowledge thus gained will be indelible ; and stands in strong contrast to the effects of that careless teaching which is content with mere verbal repetition, and requires, consequently, the same lesson to be learnt again and again. This difference, however, great as it is, dwindles into nothingness when compared with the difference in the resulting intelligence ;—cultivated, by the one system, to the highest attainable perfection, and left, by the other, to droop under the “cold shade” of an irrational routine.

It need hardly be said that the varieties of disposition and character among children, will require corresponding modifications of intellectual, as of moral, training; and will surround all rules by a considerable margin, within which they must vary at the discretion of the instructor. Not only will different minds demand teaching adapted to differences of capacity; but, in every case, there will be individual weaknesses to strengthen, and individual points of promise to bring out. Thus, in the presence of an unusual tendency to hasty or inaccurate conclusion, the exact sciences, by giving to the mind experience of absolute proof, should afford a counteracting agency; and the signs of premature hardness or precision, should be met by directing attention towards classical literature, and the study of the fine arts. At the same time, all indications of ability, or even of particular mental predilection, should be watched and ministered to: receiving opportunities for growth, and, whenever possible, the advantages of special instruction.

There can scarcely be a stronger confirmation of these statements, than is afforded by the general belief in the good influence, upon her children, of a talented mother. This belief is founded upon evidence so conclusive, and, at the same time, so familiar, that no question of its accuracy need here be raised; and it may be considered, and argued from, as an acknowledged fact. The fact is probably to be explained by the patience and diligence which, beyond all other teachers, a mother would be likely to display; by her anxiety to smooth the difficulties, and

assist the inquiries of her pupil; and by her opportunities of seizing the best occasions for instruction. Such advantages, when guided by knowledge and capacity, could not fail to bring about a system of early education similar to that recommended above; and the testimony of the eminent men who, in the height of reputation, have borne witness to the benefit received from a mother's training, confirms, both in fact and theory, the belief of the writer in the feasibility and soundness of his views.

On the other hand, it has happened, sufficiently often to be remarkable, that the children of clever men have fallen below the average in point of intellect. The cause of such degeneracy could not be positively affirmed, without a more exact knowledge of particulars, than, in any of the familiar instances, can at this time be obtained; but it is highly probable that a father, proud of his own position, and uninformed upon educational questions, has frequently sought to prepare his son for following in his footsteps; and, thinking perhaps to afford advantages of which he may himself have felt the want, has crammed him with repulsive and undigested knowledge; and has extinguished the last faint spark of thought, by the mass of fuel beneath which it was entombed. Such an explanation as this, must, it is evident, be purely speculative; but its possible truth does not admit of question, in an age and country where *schooling* is considered to be, almost, a synonym for *education*.

In the intellectual life, however, of every learner, a time will come at which something should be sedu-

lously studied for its own sake; either because required by boards of examiners, or in order to the exercise of a calling. The first inducement, where there may be little or no relation between the actual studies and the prospective duties, does not afford any great stimulus to mental activity; but the second, by giving daily experience of the utility of knowledge, commonly leads to the display of energy in its pursuit. Hence, so soon as the probable sphere of activity, for any child, can be foretold, an endeavour should be made to convince his understanding of the necessity for certain information; and to point out the means by which this may be most readily, and most thoroughly, acquired. Until a proper comprehension of these two matters has been obtained, it will be best, generally speaking, to refrain from attempts to push special instruction, and to rest content with training the faculties of the mind. An opposite course will usually excite a disgust for knowledge; its acquisition, when not aided by a sense of its importance, being always an unpleasant process, and leaving, especially if it be a result of compulsion, memories of the least agreeable kind. There are many persons of both sexes who turn, with indifference or dislike, from the master-pieces of ancient or modern literature, and, perhaps, even from the Bible itself; their tastes being perverted, through their remembrance of the hateful tasks of childhood: which, if they had first seen them at a more advanced age, would have been sources of unmixed gratification and delight. But written compositions afford pleasure, only by the ideas which they excite in the minds of those who read them; and the

‘Address to Light,’ as a school imposition, or the ‘Reflections in Westminster Abbey,’ accentuated as an elocutionary exercise, will not only be irksome at the time, to the children who suffer from them, but will probably be associated, throughout their whole lives, with ideas of an artificial and displeasing character.

When, however, the value of the required pursuit or attainment has once been realized, and the interest of the learner fairly engaged in its behalf, it will be time to teach also the great importance of industry; and to show, by history, precept, and example, the nature and extent of those results which are the unfailing rewards of its exercise. As a rule, there is no correctness of knowledge upon this point; and not a sufficient comprehension of the difference between the regular and sedulous application of willing faculties to their work,—by which the intellectual giants of our species have been produced,—and the painful imprisonment of the body to a task from which the mind cannot be restrained from wandering,—by which no benefit has ever been obtained. But, in the training of youth, there is no lesson more worthy of being taught than this. The inspirations of genius, the brilliant discoveries, which, from time to time, have flashed upon the perceptions of gifted minds, or have risen intuitively among their thoughts, these sink into absolute nothingness, when compared with the enduring and stupendous fabrics that have been raised, in all ages, by the irresistible might of persevering labour. . Perhaps, of the many undistinguished men who die, there has never been one, whose

wasted hours, if filled up by industry, would not have secured to him an honorable place among the promoters of knowledge, and the benefactors of mankind. The exquisite stanza in which the poet laments the "hearts once pregnant with celestial fire," would be far more true, if it told of indolence rather than of poverty.¹ For poverty, and its kindred evil, sickness, have been the difficulties over which perseverance has achieved its greatest and most signal triumphs. Eustace Cary, the Nottinghamshire cobbler, who translated the Bible into thirty Oriental dialects,—Mabillon, who, confined to his bed by illness, for a quarter of a century, earned the title of the most erudite of the Benedictines,—these, and many, many others, some even, among the most illustrious of our own day, crowd upon the memory as instances of the fact.² Viewed by the light of their example, the un-

- ¹ "But knowledge to their eyes her ample page,
Rich with the spoils of Time, did ne'er unroll;
Chill Penury repress'd their noble rage,
And froze the genial current of the soul."

GRAY'S ELEGY.

² The author may be allowed to quote another illustration of the results of industry, furnished by a member of his own family,—Miss Elizabeth Carter, whose name, better known in the last than in the present generation, is worthy of remembrance, not only for her learning and excellence, but in consequence of the effect of her example in promoting the education of her sex. As a child, she was unusually slow in the acquisition of knowledge; so much so, indeed, that her father wished to abandon, in her case, the plan of instruction he pursued with her brothers and sisters. By dint, however, of early rising and intense application, Miss Carter not only equalled, but far surpassed them. She became a perfect

cultivated and unthinking masses, afford, indeed, a melancholy spectacle; especially when placed in juxtaposition with that aggregate of ignorance and crime which is so foul a blot upon modern civilization; and which might be so speedily removed, by a proper employment of the opportunities that every man leaves behind him as he journeys towards his grave. Studious of ease, greedy of gain, contented slaves to custom, the minds that might regenerate their fellows are swept along; often without a perception of the duties they neglect, or of the powers that decay in silence, through the indolence and apathy of their possessors. What steam has effected for locomotion, or the tele-

mistress of the Latin, Greek, Hebrew, French, Italian, Spanish, and German, languages; attained considerable proficiency in Portuguese and Arabic; was deeply read in ancient and modern history; and was thoroughly conversant with the mathematics, astronomy, and general science of her day. Among her numerous publications, a translation of the works of Epictetus passed rapidly through several editions, and testified to her exact and critical knowledge of Greek. Yet, so little did her studies interfere with domestic occupation, that her youngest brother (the grandfather of the author) was entirely educated by her, until he kept terms at Cambridge; and the request of her friend, Archbishop Secker, that she would add a life of Epictetus to the translation, was resisted, on the plea that she had undertaken to make some shirts. Her perseverance received its most appropriate reward; for, after a life of more usefulness, and more distinction, than commonly falls to the lot of persons in a private station, she, at last, with faculties unimpaired, although in the eighty-ninth year of her age,

“From Nature’s temperate feast

Rose satisfied,—thank’d Heaven that she had lived,—
And died.”

graph in linking together distant places, an enlightened conviction of the possible achievements of industry, would do for the progress of science; and children can be taught nothing more true, nothing more likely to lead to their usefulness in life, than that, in any intellectual pursuit, perseverance will render success a certainty. The progress may be slow, the difficulties hard to overcome, but the result will follow at last,—as surely as the seasons follow one another,—and by the operation of the same unchanging laws.

The comparative utility of home, and school, education, respectively, is another question that presents itself for discussion, while considering the general principles that should regulate study. It must be conceded, of course, that it is the natural office of the parent to instruct; and it is evident that the time and patience required for proper mental training can be best afforded to a small number of pupils, and by a teacher bound to them by the ties of affection. But the circumstances of civilized life, and the desire of parents to extend the knowledge of their children beyond what they can, themselves, impart, have rendered schools a recognized and essential part of our institutions; so that the only useful way of dealing with the question is, to consider, first, how they may be most beneficially conducted; and, secondly, how the imperfections inseparable from their nature may be remedied, in the greatest degree, by the influence of home. The first question engages, as it should, the daily and hourly attention of hundreds of conscientious and intelligent instructors: the second

requires for its solution a distinct recognition of the principle, that, although the parent may delegate the office of teaching, he cannot escape from the responsibility of Education.

The great fault, to which attention has been drawn already, pervades, in an especial degree, most systems of school teaching. Children learn too much, and think too little. For this there can be no remedy, until the public are made sensible of the necessity for mental training; and until they no longer seek, as a criterion of diligence, for a certain half-yearly measure of additional acquirements. As matters stand at present, the discretion of the preceptor is too often fettered by the demands of the parent; and, under that hard taskmaster, competition, with or without straw, the daily tale of bricks must be delivered. It is the province of every profession to enlighten the world upon subjects connected with its own department; and it would be a task worthy the attention of some able and successful teacher, to put forth, in an accessible and simple form, the knowledge he had deduced from observation and experience. The books that are commonly received as guides to parents, contain, for the most part, far too many rules, and not enough of principles. When applied to real children, they often remind the bystander of Gulliver's suit of clothes, which, although shaped with the assistance of a quadrant, fitted him worse than any he had ever worn. It is enough to say, here, that the neglect of direct cultivation of the faculties of the mind is, among the better classes, the great cause of insanity; that, namely, which renders the more familiar causes

operative, and weakens the garrison by whom their power should have been defied.

Supposing that the requirements of the public were governed by a more enlightened appreciation of the real objects of education than now, commonly, exists I am inclined to think, that a system of oral instruction, by means of lectures or discourses, would, for the purposes of rudimentary teaching, be found of great utility, especially if the pupils were encouraged to ask questions, wherever the familiarity of the master with his subject led him hastily to conclude that it must be as simple to others as to himself. Such lectures could only be useful under a practical comprehension that a foundation must precede a superstructure; and that every notion must be rendered definite and clear, before there is a possibility of its being remembered or applied. But, in all cases, much will depend upon the habit and tone of mind given by the parent, who, even if school training commences at a very early age, must always have had opportunities of guiding the thoughts into a right channel; and who, by using or neglecting them, will materially influence his child's prospects in life.

One great deficiency of school teaching, however, is the absence of instruction with regard to common things; and of that floating information which, always to be found in an intelligent family circle, conduces, more than anything else, to the formation of observant habits. Boys may constantly be found, who, after passing several years at an expensive, and not exclusively classical school, are ignorant of the uses of the barometer and thermometer, and could not read off

their indications; while they would, probably, be equally uninformed upon many kindred subjects. Such deficiencies should be observed, and, to a great extent, remedied, during the home sojourn; for, if a father be compelled by occupation, or induced by idleness, to shift the office of educator from himself to others, he might always find sufficient time or energy to turn the school holidays to good account; and to try and compensate, by the measure of his conversational instruction then, for its total absence at other times.

Another consideration, of equal, or perhaps greater moment, is that a child, on entering a school, loses, for the time, all those advantages which arise, in every period of life, from improving companionship. He passes into a society where false pride and spurious honour shelter the strong at the expense of the weak; where true morality is often unknown or disregarded; where animal strength and brute courage oppress, without appeal, the timid or the defenceless; and where knowledge itself is sought, rather to surpass others, than from a perception of its own excellence. In girls' schools, from the natural difference between the sexes, as well as from the different habits that they are permitted or taught to acquire, there is an atmosphere of less violence, though often of greater cunning; and in all, the state of things is simply dependent upon this, that the members of the small community are not sufficiently enlightened to perceive their own true interests. In the world without, the same passions and motives actuate men and women; but society, for its own sake, has set strict limits to

their display. In the school, however, these limits are scarcely recognized; and the teacher can seldom possess the confidence of his pupils sufficiently to interfere, with any prospect of advantage, for the settlement of disputes among them. It is true that the infamous brutalities so long tolerated in public schools have, at length, received the unqualified condemnation of public opinion; that this opinion has made itself felt in smaller establishments; and that their proprietors endeavour, by the cultivation of a correct moral tone, and, pending its slow growth, by strict surveillance, to prevent any gross instances of tyranny. But the reform, to be effectual, must be in the children themselves, and must be wrought, generally, within their own homes. Another generation, at least, must pass away, before there is a prospect of such reform being completed: and, in the meanwhile, it is the plain duty of parents to scrutinise, most carefully, the effect, upon their children, of the society into which they are thrown. The temptation to domineer, on the part of the strong, and the temptation to deceive, on the part of the weak, are, perhaps, those to be most guarded against; it being remembered, in every case, that the years of school-life are not years of learning only, but a time in which, more than in any other of equal duration, the character and disposition receive their distinctive stamp. Parents are, generally speaking, very watchful with regard to the home associates of their children; and, where the associates themselves are beyond the range of observation, it is evident that similar watchfulness should be practised with regard to the effects of their influence or example.

Home education is believed, by many persons, to labour under a great disadvantage in affording no standard of comparison to the pupils, who, it is said, for want of being acquainted with the powers or performances of others, are apt to form an inordinate estimate of their own merits and acquirements, and to suffer disappointment, in consequence, when their real position is brought home to them by the events of life. If this objection be founded upon experience, it says little for the instructors whose mismanagement has caused it to be true. For, in the first place, there can be few positions of such complete seclusion as to allow a child no opportunity of trying strength against contemporaries; and, even supposing such a position to be possible, a teacher, whose attention is directed to the subject, may always contrive that undue self-sufficiency shall bring about its own refutation. The absence of competition between learners, and especially between learners of different mental capacities, is a great advantage on the side of home; inasmuch as the feeling called emulation acts upon the memory more than it does upon the understanding. Pupils who are influenced by it, and, commonly, their teachers also, are apt to be content when a thing is learned, without inquiring minutely whether it is comprehended; and, after yielding, once or twice, to the temptations which produce this result, they bring their educational process to a beautiful simplicity which conceals, for a time, its hollow and worthless character. The mind cannot be forced into premature activity, although the memory may be loaded with undigested knowledge. And, just as home affords the

greatest facilities for the cultivation of the understanding, so school affords the greatest, for the acquirement of book-learning. Each, therefore, should be used for its own proper purposes; and home, if its special advantages be neglected, is worse than a school, where advantages of another kind are certain to be perseveringly utilized.

The length of the actual periods of study, and of the intervals that should separate them, cannot be fixed, to the greatest advantage, without considerable exercise of observation and thought. As there is a difference between individuals, whether children or adults, in point of capacity for physical exertion, so also is there with regard to mental; and no absolute rule can be assigned for either. In the case of young children it is best, generally, when they begin lessons, to fix only the hour for commencing; and, keeping strictly to that, to release them from work when their attention can no longer be restrained from wandering. After a time, their power to sustain application will be pretty well known; and should then be made the basis of further operations: subject, however, to this constantly remembered principle, that the exact age at which the pupils read or write, or master their earlier lessons, is of little consequence, compared with the advantages likely to follow from the avoidance of fatigue and disgust. As a rule, teaching is better retarded than hurried, the intelligence being the thing of real importance, and the learning of this or that being only a secondary consideration.

The chief difficulties, with regard to the division and employment of time, arise only when children are

fairly engaged in systematic learning; but they then increase continually, until resolved by the arrival of adult age. They depend upon the conflicting claims of body and mind, each demanding its share of nourishment and exercise; upon the thirst for knowledge, which induces many children to encroach upon their hours of recreation; and upon the indolence, which induces others to encroach upon their hours of work.

In considering this part of the subject, it is necessary to bear in mind that the intellectual faculties, like all the others we possess, are dependent upon the soundness of their bodily organ; and that the health of the brain must be secured, as an essential preliminary to the exercise of its functions. The nervous tissue, although possessing great power to resist injurious influences, is, nevertheless, liable to be affected by them; and may fall out of condition, from over-exertion, from insufficient food, or from constitutional causes, without being, in the ordinary sense of the words, the subject of diseased action. In its enfeebled state, the faculties to which it is subservient will lose, both in readiness and in power; and any exertion that is called forth by an unusual stimulus, will be followed by a period, apparently disproportionate, of lassitude and incapacity. A weakly child, or, indeed, any child, if compelled to perform excessive mental labour, will suffer in health, through the withdrawal of nervous force from the nutritive operations; and, while the muscular and digestive organs will be first affected, the brain and nervous system will, ultimately, be involved. Hence, in every case, some judgment should be employed, to determine how much exertion

of mind is compatible with high bodily health; and the opposite, but far more common question: How much time can be spared from the teaching, for the purposes of exercise and recreation? is one that, in these days of enlightenment, should neither be asked nor answered.

In the majority of schools, the difficulties indicated above are met by the establishment of fixed rules; embracing either all the pupils, of whatever age, size, strength, or capacity, or perhaps only the members of each class, who are placed together, generally, by a presumed equality in point of attainments. Such a system may succeed very well, where the amount of work required is not too great; and where a discerning indulgence is extended towards the less gifted, so that they, although confined to their tasks for the same time as their companions, are not subjected to a disproportionate demand upon their memories and understandings. Often, however, these precautions are not observed; and the slow child has to suffer all the torments of fear and anxiety, as well as to accomplish a task that is far beyond his natural and unstrained powers. There is a large public school in London, from which delicate boys, ten or twelve years of age, are suffered to carry home, almost daily, work that occupies them until near midnight; and of which the rules, and hours of study, are so arranged, as to preclude the very possibility of sufficient recreation. The man in the fable, who killed the goose that laid the golden eggs, may rank as a philosopher, when compared with the sages who are responsible for these foolish and wicked practices. Putting aside every

other consideration, they are diametrically opposed to true economy. It would be better, generally speaking, for parents; better, always, for the child, that more years should be spent at school, more time occupied in the process of word-cramming, than that one fibre of the body should be relaxed through confinement, or one cell of the brain left incomplete through toil. In the former case, it could only be said, that so much time was lost; in the latter, an injury would be inflicted, whose results might impair the strength, or warp the intellect, even to the end of life.

Sometimes, and especially in one highly successful private school, the hours of study are fixed, by every boy, for himself. In the instance referred to, there is a limit (eight hours a day), which no pupil is permitted to exceed; and, within this limit, each one fixes, on the first of every month, his daily hours of study until its close. Precautions are taken, chiefly by cultivating a high tone of public opinion among the boys, to prevent the abuse of the privilege; and the system is found to produce excellent results. But these must be due, in great measure, to the good sense of the gentlemen who conduct the establishment: it being always found that discretion and tact are required, in order to adapt rules, even the most admirable, to the community that they are designed to govern. In the case of children, if their lessons are rendered intelligible to them, there will seldom be any necessity to stimulate them to exertion; and during the time of youth, as well as of early maturity, it is often necessary to repress the manifestations of a desire to excel. Young men and young women,

under the influence of a collegiate or scholastic atmosphere, are frequently crippled, alike in mind and body, by the effects of excessive and premature study; and they suffer far more than their juniors, because possessing, and induced to exert, the power of application in a far greater degree. I have seen the wreck of a wrangler, stretched for months upon his father's sofa; and, during the last year, the attention of the medical profession has been strongly directed towards an institution in which young ladies are taught all knowledge, but where the ruling powers act upon the familiar maxim, that it is better to wear out than to rust out. It is not good, however, to wear out too early; and, in judging of an educational system by its results, the usefulness of the pupils in life, rather than their readiness at the periodical examinations, should be taken as the test of true success. With regard, moreover, to experimental systems, the persons who found them should always remember that fundamental maxim in political economy, that learners must necessarily spoil a portion of raw material; and therefore, in the conduct of a new institution, those who are responsible for its management should keep carefully to the principles which are based upon observation of the laws of life; and should never hazard the precious "material" committed to their hands, by pursuing a course in which their own footsteps will require a guide. Within certain limits they are safe; beyond them, the mischief they will do must be great, and may, perhaps, be incalculable.

Departing, for a few sentences, from the proper subject-matter of these pages, it may be observed that

the foregoing remarks apply, both in fact and principle, almost solely to the season of youth. This season past, the healthy human mind becomes capable of great exertion; and, probably, many of its most remarkable works should be regarded as the effects of a determinate purpose, rather than of any special or unusual powers. And, on the other hand, so little necessity is there for cautions against overwork, that, in middle age, the incapacity produced by indolence is the evil to be chiefly guarded against. Perhaps for the very reason that children are so sedulously crammed, and in consequence of the disgust excited in their minds by the process—perhaps from the want of real mental education—these children, on arriving at maturity, do not, as a rule, exert their intellects sufficiently to preserve them in vigour. Of this, there can be no evidence more conclusive than that which is furnished by the current literature of the day. Putting aside purely scientific treatises, and books of any kind, that are intended only for a limited circle of readers, there are scarcely any, among the residue, addressed to the reason and sense of the public, in support of definite and intelligible propositions. Sectarianism, religious or political, disguised under a thin covering of romantic fiction; appeals to passion, superstition, prejudice; objectless novels, or merely entertaining narrative; such is the great bulk of the matter that issues daily from the public press. “Thus,” in the words of Bishop Butler, “people habituate themselves to let things pass through their minds, as one may speak, rather than to think of them. Thus, by use, they become satisfied merely

with seeing what is said, without going any further. Review and attention, and even forming a judgement, becomes fatigue; and to lay anything before them that requires it, is putting them quite out of their way." Of the numbers whose time is engaged in specific avocations, how few there are who know how completely the mind may be rested by a change in the nature of its pursuits. Of the numbers who possess the great blessings of health and leisure, how few there are whose intellects bear fruit to the advantage of their fellow creatures. In the meanwhile, the follies of a mountebank are rewarded by a golden harvest; and the falsehoods of an impostor need only be loudly uttered, in order that they may captivate the understandings, and lighten the purses, of nearly every section of the community.

It is often said, by those who are apologists for the present condition of the public mind, that the intellects of men, in these stirring times, are fully and usefully employed upon their own affairs, upon the duties of social position, or upon the exigencies and cares of business. These demands, it is argued, afford complete occupation to the majority of persons, and overtax the energies of many; rendering them unfit, in their hours of leisure, for the investigation of abstract philosophical truth; and compelling them to take refuge from indolence in the pursuit of mere amusement.

Such arguments as these, however, rest upon assumptions for the most part groundless; and do not deserve to be regarded in any better light than as lame excuses for the sin of sloth. Rochefoucault said

of hypocrisy, that it is the homage paid by vice to virtue; and the pretence of being so much occupied as to have no leisure for thought is, certainly, the homage which folly pays to wisdom. The statement may be true of some individuals; but those who make it can scarcely realize what would be the condition of affairs, were it ever true of the community.

In the first place, it is hardly possible to conceive an employment or vocation which can exhaust the intellectual energies of those engaged in it. The physician, the lawyer, the merchant, each daily performing acts of memory, comparison, and judgment, that call forth the wonder of the uninitiated, are each assisted, in an extraordinary degree, by their familiarity with the data from which their conclusions spring. Certain information once stored up, and certain experience gained in its application to the events of life, habit will accomplish nearly all the rest; and will accomplish it with little exertion or fatigue, through the secondary instincts that grow from an accustomed act. Thus, the distinct symptoms that indicate a disease, the intricacies of a legal question, or the several conditions affecting the commercial market, are presented to minds habituated to their study, not in the form of separate and detached particulars, but combined into a fact or an opinion, as printed letters are combined into a word. Occasionally, of course, some unusual occurrence will arise, upon which this half-unconscious judgment cannot be practised with success. Then alone the intellect is really taxed; then the mind is called upon to arrange the facts in their order, and to decide upon their

relative importance ; and then the man who is accustomed to think, upon whatever subject, and to make such volitional exertion of his faculties as may retain them completely under his command, will, provided that he possess a sufficiency of technical information, have an immense advantage over the *routiniers* who make up the majority of mankind. There are hundreds of worthy people so unaccustomed to reflection, that, if they are placed in a dilemma, their minds do not get beyond a consciousness of being puzzled ; and who would be unable to arrange their ideas in a connected sequence, even if by doing so their deliverance were ensured. Of such are the persons who love to edify their acquaintance, from time to time, by good and true, but entirely self-evident remarks ; and their brains may be described, without grave inaccuracy, as self-acting machines for the attainment of obvious conclusions.

It is incontrovertibly true that men actively engaged in business suffer their affairs to occupy their thoughts, to the exclusion of other matters ; and often to their own serious injury. They do so, however, far more through the passions than through the intellect ; and are not, commonly, judging of questions to be decided, so much as they are dwelling upon possible contingencies, or attending to feelings of doubt or anxiety. Often, the best open course will scarcely admit of question, and will not detain the judgment, even a moment, to determine it ; but the uncertainty how good or bad that best will be, may, nevertheless, weigh upon the mind through the emotions, and restrain the natural freedom of the intel-

lect. This is what people experience when they fancy that they are *thinking* about their affairs; and the attention paid in this manner to the worst aspect of an uncertainty that time alone can render clear, is a very common cause of mental derangement; or, in its minor degrees, of fretfulness, irritability, and their many concomitant evils. The man of "anxious temperament," does not possess sufficient control over the operations of his mind to withdraw, at will, from fruitless meditation; and, when his decision has been formed and acted upon, his thoughts still haunt the scene of their employment. But a proper cultivation of the intellect would prevent, or greatly assist in preventing, this mischievous and automatic attention; and would enable persons to fix their minds upon some fresh subject, when once the time for action had passed by. They would find at once, in the change, rest from labour, and relief from care; and their conduct would be as much the result of deliberation, as if they had occupied weeks in re-considering the irrevocable past. To a great number of those who are engaged in the business of life, each day brings its occasions of anxiety, as necessary results of the most common-place transactions; but it is only now and then that profound or long-continued thought can be required. Men of business, therefore, more perhaps than any other class of the community, would profit by the diligent cultivation of thoughtful habits; which would afford to them, not only an useful and trusty intellect against their greatest need, but a means of diverting attention from the mischances which break down so many, among those who are called upon to bear them.

It is in this sense, and probably in this sense only, that the observations of the late Dr. Young, and of other writers following him, should be understood. They held that the mind should be cultivated in more than one direction, or even in as many as possible, by every person; without regard to the nature of his pursuits. Their doctrine stands, of course, in direct opposition to the common feeling that professional men, if it be their wish to excel, should restrict themselves to the studies connected with their own vocations; and, as is usual in such questions, truth may be discovered between the extremes. The extent of science—the shortness of life—render it an absurdity to occupy time in the acquirement of the technicalities of another calling; or in attention to facts that cannot, under existing circumstances, be rendered practically useful. The physician would be blameable who devoted his evenings to the methods of procedure in the courts of Chancery: the lawyer, who strove to acquaint himself with the nice distinctions of the sick room. But the former may improve his mind, may enlarge his understanding, and may bring a clearer head to the service of his patients, through study of the great principles of jurisprudence; and the latter will be better fitted to expound or to administer the laws, if he possess some knowledge of the structure, and working, of that organism which laws are intended to control. As a general rule, it may be said, that the proper exercise of the judgment, upon any subject, increases the natural capacity for the performance of every act in which judgment is required; and, as the mind cannot be constantly

chained to one kind of labour, so a studious recreation will occupy, to the greatest advantage, the hours of necessary rest. It is the duty of every man to be master of his appointed work, and to give his first and best attention to the knowledge which he undertakes to carry into practice; and this duty, if neglected by some, is sure to be fulfilled by the men whose very intervals of labour are applied to profitable uses. The professional man, who devotes spare time to science, to literature, or to the fine arts, is often censured, by the unthinking and the ignorant, for presumed neglect of his especial department; but such censure seldom issues, save from persons who spend their own leisure after the manner of the slothful. And, when the alternative is idleness, any pursuit becomes dignified and profitable, in whatever light those who follow it are regarded: whether simply as intelligent beings; or, more correctly, as creatures accountable for their use of time.

There are, it will be manifest, many individuals among the educated classes, who cannot devote their leisure to intellectual pursuits, because their occupations require active physical exertion, and entail corresponding bodily fatigue. But this circumstance is assigned, as an idle pretext, far more commonly than it exists as a fact; and there is, perhaps, no recorded instance in which it has conquered a sincere desire for knowledge. Custom, however, has sanctioned a neglect of the intelligence; and ignorance and stupidity are scarcely thought disgraceful, because it is so easy to fall into, and so difficult to escape from them. Hence, the eminent men who have adorned

each successive generation, have been pointed at as prodigies, when they should have been studied as examples; and a superstitious misapplication of such words as "talent" and "genius," has exerted a paralyzing influence upon minds that might have equalled, or perhaps surpassed, those whose memory we now hold in veneration.

The relative value of various kinds of study, as means or instruments of education, has lately furnished subject-matter to several very able lecturers, whose discourses, delivered at the Royal Institution, have since been published, and widely circulated. It will be long before the precise topics which they have treated can require, or receive, any farther elucidation; but there are still a few words which may be said upon one or two kindred questions.

The first and universal means of education is, it need hardly be said, the study of Language; not of languages, as such, but of the art of communicating ideas through the agency of sound. The mother-tongue, as it is gradually acquired, may always be made the foundation of correct and exact habits of mind; habits which it is impossible to establish too early, and of which the utility, and importance, cannot be too highly estimated. During childhood, more knowledge may be conveyed to the mind through accounts of the derivation, and exact meaning, of words, than, perhaps, in any other way; and the names of the most familiar things may be made fruitful of information, and of the materials for

thought. For the distinctions between words, and, indeed, nearly everything that can be taught with regard to the art of speaking, may be applied, at once, by the pupil, to practical uses; and, hence, will be listened to with greater pleasure, and remembered with greater facility, than facts of more importance in themselves, which are devoid of this advantage. A child whose attention has been directed to the matter, will soon feel pride and gratification in being able to speak correctly; and will not utter the most simple sentence without performing, voluntarily, a beneficial mental exercise. At first, it will be sufficient to teach the meaning of elementary words; but, as time advances, a knowledge of grammar becomes necessary. For, although children who mix with well-educated people form, generally, good habits of speaking; yet they are, in most instances, unable to give a reason for their accuracy; and it is often found that familiar conversation, and writing, are obscured by the grossest blunders. Moreover, it being proposed to make the gradual acquirement of language a means of mental education, and an occasion for the frequent exercise of the intellectual faculties, all *habits*, whether good or bad, (except the habit of thinking before speaking,) are equally to be avoided; as well as all mere *rules*, which hold towards the mind, before they are understood, a somewhat analogous position. When reasons have once been mastered, rules preserve them in a form convenient for reference, and present them readily to the memory; but when the rules have been learned first, and blindly followed, the reasons for them will seldom or never be investigated. It is,

therefore, worse than useless to teach the rules of grammar, and to call upon children to apply them; inasmuch as the reasons for these rules, and their meaning, constitute the knowledge that is required, and that will alone be useful. When enabled, by its possession, to express himself correctly, a child will have made great progress towards habitual accuracy; and his instructors may, then, distinguish confusion of thought from mere obscurity of diction. The practice of loose speaking, besides leaving room for doubt with respect to the meaning of what is said, leads to carelessness, on the part of the speaker, in the formation of ideas; an evil with which exaggeration, and other verbal errors, are likewise chargeable. The often-quoted aphorism of Bacon, that reading makes a full man, writing an exact man, and speaking a ready man, owes much of its truth, as far as the contrast between the latter conditions is concerned, to the prevailing carelessness. Children should be taught, from the first, to be as exact in their speech as it is necessary to be in writing: to know thoroughly what they mean, and how they should express it, before they commence a sentence; and their speech would soon be no less fluent, for being accurate. If, however, they are allowed to *talk* nonsense, it is too much to expect that they will *think* sense.

The rudiments of grammar are commonly set forth in a shape so distasteful, so artificially repulsive, that authors upon the subject deserve, for the most part, the commendation that was once bestowed by a judge upon an agricultural witness. "Sir, you are entitled to great credit. You must have taken pains with

yourself. No man was ever naturally so stupid." But it is plain that the art of speaking is not, necessarily, beset with the difficulties that are to be found in books ; and parents, who desire to train their children in the knowledge that can alone ensure correctness, cannot do better than study Cobbett's English Grammar. The principles laid down in that excellent treatise may be taught to a child, in conversation, long before he could learn them as a task, or by reading ; and the time at which he will be able to speak perfectly should be talked of by anticipation ; this accomplishment being thus made an object of hope and ambition. When an error is committed, either in the meaning of a word, or in the construction of a sentence, it should be pointed out and explained, but never ridiculed. A child who is laughed at for mistakes will soon become shy of speaking, except in the presence of persons who are not likely to be critical ; and will thus lose the advantages of practice, as well as the information to be gained from a proper notice of blunders. Moreover, as the process of teaching is intended to be made beneficial, early correctness is not to be desired, so much as careful attention to the sources and varieties of error.

The study of foreign languages, whether dead or living, may be turned to the same advantage as the acquirement of the mother-tongue, provided that the teacher be sufficiently learned, and the pupil sufficiently in earnest. It would, indeed, be impossible to master thoroughly the forms of speech of any civilized people without attaining, incidentally, a high degree of mental cultivation. But foreign languages,

as they are usually taught, are far from fulfilling so good a purpose; and do not present any points of remarkable difference from other studies that require a certain exercise of memory and attention; and that may, at some time or other, be practically useful in life. The professor, of whom Porson said that he understood Greek like an Athenian cobbler,—the persons constantly met with, who speak broken French or German, and who perceive an outline of the meaning of compositions written in those tongues, do not gain from them, it must be evident, any of the special benefits which ought to attend upon the study of language, because their knowledge is not sufficiently accurate or extensive. They are unable to appreciate nice differences and fine shades of meaning, they are, in respect of the languages which they profess to know, illiterate persons; and the advantages which they should gain from reading in them, are diminished in a proportion accordingly. The young lady fresh from school, will probably read Göethe or Racine with as much appreciation as her maid-servant would have for Shakspeare: each understanding the obvious meaning, following the incidents, and being made acquainted with the catastrophe; but each unobservant of the wit, the wisdom, the subtlety, sparkling on every page, and slightly concealed in the turn of every sentence. It is, however, these refinements of language, and these delicacies of thought, that furnish food to the mind, and call the intellect into activity; exciting, in the readers who understand them, ideas kindred to those of the author; and elevating their psychical nature to a height that approaches his.

The mere narrative, however, appeals only the imagination or the passions; and might as well be told, to those who are unobservant of the beauties of style, in the tumid language of a third-rate novel.

From the principles by which the foregoing considerations are supported, it may be inferred, farther, that, of the several parts into which the study of languages may be divided, the most productive, intellectually, will be that which embraces meaning; and which deals with speech as the instrument and vehicle of thought. Questions concerning the derivation and relationship of words or dialects, although highly useful in the hands of cultivated men, and for the advancement of science, are not calculated to excite, in the mind of a learner, so high a kind of activity as that which is required for a perfect apprehension of the ideas of others. The power of correct pronunciation, however valuable to those who are desirous to converse, is an attainment too completely sensorial to influence, in any great degree, the operations of the mind. But it is through the understanding of words in their several shades of meaning; and of grammar, in so far as it is subordinate to sense, that real benefit can be expected: the learner whose labours are turned in these directions becoming wiser, not only in respect of the language which he has gained; but in respect of his power to comprehend, and to sympathise with, the thoughts and feelings of his fellow-creatures. To these attainments, therefore, should children be encouraged to apply themselves, when it is sought to make language a means of education; and they should especially be familiarised with the

mind of a foreign people, through those idiomatic forms of speech, which are, under all circumstances, so much more characteristic and impressive than the regular methods of construction.

Next, perhaps, in importance, to the study of Language, may be placed that of Mathematics, using the word in its most extended sense. The time during which a parent might render language useful, is, in too many cases, allowed to slip by without any mental culture whatever ; and, as if to compensate for delay, the exact sciences, in some shape or other, (generally a very repulsive one,) are presented to a child when he has reached a particular age ; or when, as it is said, his education is to begin. The terrible “*pons asinorum*” has long been a stumbling-block to learners thus treated ; and an evidence that tasks which appeal to the reason must be understood before they can be remembered. But the difficulties by which this bugbear, and its kindred, are surrounded are mostly artificial ; and such of them as are real may be obviated, in great measure, by a little patience and management.

The great utility of mathematical studies, when the intellect can be made to apply itself to them kindly, will hardly, I apprehend, admit of question. There may have been, during the world’s history, a few minds so organized as to be independent of the assistance which the exact sciences are calculated to afford. If so, the possessors of them must have been mathematicians from their birth ; and, perhaps, the names of Newton and Pascal may be cited as instances in point. These illustrious men may have received, from Nature,

reasoning faculties so organized, as to be almost independent of instruction or practice; and, however situated, they might still have been eminent among the benefactors of mankind. But, for ordinary persons, the case is widely different; and the use of the mind must be acquired through labour, before it can be practised with advantage. Either directly or indirectly, the child must be taught how to think; for, if such teaching be withheld entirely, the opinions of the man will commonly be fallacious. From the very nature of the act involved, direct instruction is hardly practicable; and, on this account, those lessons or events are to be valued which accustom the mind to sufficient evidence, and sound conclusions; or which lead it into a track already beaten by the footsteps of a safe and acknowledged guide. A child able to feel some interest in mathematics, and accustomed to the kind of argument, and of proof, which this science affords, will hold a very different intellectual position, and will require, in order to his being convinced, a very different sort of evidence, from another, who, equal to the first in age and natural ability, has been limited to the study of "exploded errors in extinct tongues." Given a perfect intellect, and then, perhaps, crude reasoning and doubtful statements might supply to it the means of useful activity. Given such an intellect as may commonly be found, and then it will be best and safest to scrutinise, very carefully, the materials with which it is permitted to work.

It has been argued by some writers, and, I believe, by one of great authority, that mathematics should

not be too much used, as a means of education, lest it should lead pupils to require, for their satisfaction, in all cases, a more rigorous proof than it is usual, in the circumstances of life, to obtain. People are constantly required, it is said, to rest satisfied with, and to act upon, a high degree of probability. If they were taught always to demand proof, they would, in many cases, suffer the right time for action to escape them; and would not be satisfied with this high probability, which, as it is frequently all that can be gained, supplies, in such cases, a proper and sufficient rule of conduct.

In reply to these observations, it may be urged that the danger which they imply is imaginary, rather than real; and that, while the result feared is certainly conceivable, it is very far from being likely. The very weakness and imperfection of the human mind, while it renders it desirable to have a high standard of intellectual, as of moral, excellence, greatly diminishes the probability that this standard will ever be reached. The limits of these pages do not permit of a discussion upon the nature of *belief*; and an examination of the degree in which it may, sometimes, be independent of the intellect: but it will be readily perceived that, in matters requiring action, the emotions must usually be brought into play; and must serve to fix the attention, with what may be styled a partial or unfair tenacity, upon the evidence in support of the thing that is either desired or feared. The sanguine man, who makes a bold stroke, perhaps against conviction, *hopes* that all will be well; and throws his hopefulness, as a makeweight, into the

same scale with the reasons that support his decision. The timid man, who wishes to be upon the safe side, is actuated by contrary feelings, which produce in him, by the same kind of operation, an opposite result. In neither case is the ultimate effect strictly dependent upon the evidence; for the lesser probability may often be acted upon, in consequence of the additional power which it may gain from the dominant feeling. In abstract or scientific questions, or in matters purely intellectual, it cannot be contended that high probability should ever stand in lieu of demonstration; because, with regard to all these, it is constantly necessary to suspend the judgement and to remain in doubt. It has been alleged, very frequently, that mathematical studies conduce to religious scepticism; but for such a charge there can be no sufficient foundation. It is probably true that some shallow thinkers may have made profession of infidelity, that they may also have acquired the terminology of mathematical science, and that they may have assigned the absence of proof as the cause of their unbelief. But the error of such persons rests in their demand for evidence of a kind which has not been furnished; and which has, in all probability, been designedly withheld. The utter absurdity of their objection may be rendered manifest, by extending its application to other particulars of their conduct; and it may be shown to be a mere excuse, which can seldom deceive those who make it, and ought never to deceive others. Generally, it may be said that the utility of mathematical studies depends, chiefly, upon their accustoming the mind to argu-

ments that render weak or inconclusive reasoning distasteful; but that such studies do not, of necessity, excite an unreasonable desire for proof, under circumstances which render it apparent, to any ordinary understanding, that proof cannot be afforded. The eminent mathematicians, whose names have been mentioned above, are examples, among many others, that the highest attainments in their favorite science have co-existed with the most earnest and practical religion; but it would not be correct, on this ground alone, to claim for the former a devotional tendency. Such a tendency it can possess, only in common with the many other means of intellectual cultivation which combine, by raising the mind of the creature towards that of the Creator, to justify the use, as convertible terms, of the words *piety*, and *wisdom*. In the government of ordinary conduct, in the opinions formed upon questions arising out of social intercourse, and in the pursuit of religious truth by the earnest and reverent inquirer, it is hardly possible that the study of mathematics can exert any prejudicial influence; or that it should even retard, in any material degree, the operations of the judgment. On all these questions, the feelings are necessarily thrown into the scale; and, when they fall upon the side opposed to truth, there is no power in mathematics to prevent men from being self-deceivers.

The way in which the exact sciences may be presented, at the greatest advantage, to the mind of a child may differ in different cases; but there can be no exception to the rule that they should, in the first instance, be made

interesting: so that they may at once stimulate and reward the industry required for their attainment. As far as the 'Elements' of Euclid are concerned, there are some ingenious Chinese demonstrations of the theorems, by direct appeal to the senses, that are exceedingly well calculated to excite inquiry with regard to the universality of the principle at issue. The forty-seventh proposition of the first book furnishes a good example, because when the sides of the right-angled triangle are drawn in a proportion of 3, 4, and 5, the squares formed upon them may be respectively divided into 9, 12, and 25 equal and smaller ones, thus at once affording the necessary demonstration, as far as the particular triangle drawn is concerned. By playthings, puzzles, and through many other methods, the same plan of teaching may be pursued; and an ingenious child will soon receive much pleasure from the knowledge that is thus imparted to him, and will readily enter into the reasons that explain the facts. In algebra, too, an occasional substitution of figures for x and y , throughout the whole process, and a judicious selection of questions and examples from familiar things, will greatly assist the comprehension of a child; and many teachers who are accustomed to routine would be surprised to witness the degree of real mental cultivation that may, by attention and care, be brought about at a very early age. Not that it would be judicious, or even probably successful, to dispense with regular tasks and set instruction; but it would, in most cases, be highly desirable to postpone them longer than the present custom will allow; both for the attainment of a riper age, and for the

prior establishment of some elementary knowledge of, and some curiosity about, the thing proposed to be taught.

To the facts of Natural Science, as a means of education, a very high place has already been assigned. When sufficiently known for their full effects to be produced, they may, perhaps, deserve to hold the highest; and that, chiefly, on the ground which has been set forth by Paley. "Perhaps," he says, "almost every man living has a particular train of thought, into which his mind glides and falls, when at leisure from the impressions and ideas that occasionally excite it: perhaps, also, the train of thought here spoken of, more than any other thing, determines the character. . . . The train of spontaneous thought, and the choice of that train, may be directed to different ends, and may appear to be more or less judiciously fixed, according to the purpose, in respect of which we consider it: but in a *moral view* I shall not, I believe, be contradicted when I say, that, if one train of thinking be more desirable than another, it is that which regards the phenomena of nature with a constant reference to a supreme intelligent Author. To have made this the ruling, the habitual sentiment of our minds, is to have laid the foundation of everything which is religious. The world from thenceforth becomes a temple, and life itself one continued act of adoration. The change is no less than this, that, whereas formerly God was seldom in our thoughts, we can now scarcely look upon anything without perceiving its relation to him. Every organized natural body, in the provisions which it contains for its sustentation and propagation,

testifies a care on the part of the Creator expressly directed to these purposes. We are on all sides surrounded by such bodies; examined in their parts wonderfully curious; compared with one another, no less wonderfully diversified. So that the mind, as well as the eye, may either expatiate in variety and multitude, or fix itself down to the investigation of particular divisions of the science. And in either case it will rise up from its occupation, possessed by the subject, in a very different manner; and with a very different degree of influence, from what a mere assent to any verbal proposition which can be formed concerning the existence of the Deity, at least that merely complying assent with which those about us are satisfied, and with which we are too apt to satisfy ourselves, will or can produce upon the thoughts.”¹

With reference to the intellect, the greatest utility of natural science is due to the stimulus which it affords to the exercise of observation; and to its tendency to occupy the mind with external things, rather than with its own spontaneous operations. Whatever special influence may be ascribed to particular branches of study,—however the astronomer may be led to echo the language of the inspired Psalmist, “What is man, that thou art mindful of him?” or the physiologist to trace out the evidences of economic design,—still the culture of the observing faculty must remain as the great general result, through which, if at all, the others are produced. It is this, therefore, that should first be aimed at, as a means, if not as an end; and it is only

¹ ‘Natural Theology.’

through its attainment that farther benefits can be reasonably expected.

The branches of natural science which may first be turned to good account are, it is evident, those of which the subjects are most common and familiar. The habits and metamorphoses of insects, the actions of birds and animals, and the various phenomena of vegetable life, each or all, according to circumstance or locality, may be made available; and may, after a time, be earnestly studied. But, in early lessons, especially in those departments of inquiry for which there are abundant materials, such as botany, conchology, and the like, it should be carefully remembered that it is in the works of God, and not in the distinctions or arrangements of man, that true instruction is to be found. The purposes of a shell, its structure, and manner of growth, afford a lesson not to be deduced from its sesquipedalian name, or from the number and colour of its spots. The manner in which a plant is adapted to the conditions of its life, to its soil and atmosphere; the purposes which it fulfils, and the place which it holds, in the perfect order of creation; and the nature of the daily changes which issue in its growth and its decay—lead the mind to higher considerations than any which flow from mere classification, or from a knowledge of the barbarous technicalities which so often obscure a scientific description. Viewed with respect to education, it is the province of science to generalize, rather than to classify; and there can be no more injurious kind of teaching than that which is founded upon an opposite course, and which divests creation

even of the interest which it possesses for the uninstructed. I have seen a child endeavouring to acquire the elements of botany from a text-book which, except in the absence of a column of prices, bore more resemblance to a seedsman's catalogue than to a scientific treatise; and which could not claim superiority, in any single respect, over a Latin grammar or a spelling-book. Such employment was an exercise of memory, but a very worthless one; and recalls the excellent words of the poet:

Sweet is the lore which Nature brings;
Our meddling intellect
Mis-shapes the beauteous forms of things:—
We murder to dissect.

The study of the various modes of activity of physical force, as of chemistry, electricity, &c., is always eagerly pursued by intelligent children, to whom the opportunity has been afforded. They are delighted by the curious experiments; and proud of the power of performing them. But, unless their steps be carefully guided, they may tread upon very treacherous ground, they may easily mistake their smattering for knowledge, and may contract rash and presumptuous habits of mind. These dangers arise from the share which they themselves appear to have, in the production of the phenomena that they witness; and are mentioned in order to suggest, that, whatever study of this kind a child may be allowed to engage in, he should always be under the observation of a mind superior to his own, not only in power, but in special knowledge also.

The highest branch of natural science, whether in respect of its object, or of the ends to be arrived at through its pursuit, is that which deals with the most lofty of the works of the Creator, the intellect of man. The study of mental philosophy is not only of the greatest value as an exercise ; but it is almost the only source of intellectual self-knowledge : affording a protection against *idola* that can be gained in no other way. The obscurity which characterises a certain school of metaphysical writers has, most unfortunately, lowered the science itself in the estimation of the public ; and has occasioned the utterance, and the repetition, of some shallow drolleries that pass current for truths, even now, among people who ought to be better informed. But as (to paraphrase the illustration of Professor Faraday) the possessor of a perfect musical instrument would, almost certainly, endeavour to comprehend its mechanism, and to gain command over its utmost capabilities ; so the possessor of an intellect should be excited to similar curiosity : and should not remain in contented ignorance with regard to the source and nature of the powers which distinguish him from the beasts that perish. In mental philosophy, as in every other worthy and dignified pursuit, a certain degree of attention cannot be dispensed with ; but real obscurity must always be the fault of a bad writer, and in this, as in every other instance, must depend upon a want of precise notions in his own mind. A man who thinks clearly will never write obscurely ; and one who thinks obscurely should content himself as a follower, instead of aspiring to be a guide. There is no department of know-

ledge in which mysticism should be less excused than in this; for reasons which are admirably expressed in the following passages, translated from D'Alembert by Mr. Dugald Stewart. "Truth in metaphysics resembles truth in matters of taste. In both cases, the seeds of it exist in every mind; though few think of attending to this latent treasure till it be pointed out to them by more curious inquirers. It should seem that everything we learn from a good metaphysical book is only a sort of reminiscence of what the mind previously knew. The obscurity of which we are apt to complain in this science may be always justly ascribed to the author; because the information which he professes to communicate requires no technical language appropriated to itself. Accordingly, we may apply to good metaphysical authors what has been said of those who excel in the art of writing, that, in reading them, everybody is apt to imagine that he himself could have written in the same manner.

"But, in this sort of speculation, if all are qualified to understand, all are not fitted to teach. The merit of accommodating easily to the apprehension of others notions which are at once simple and just, appears, from its extreme rarity, to be much greater than is commonly imagined. Sound metaphysical principles are truths which every one is ready to seize, but which few men have the talent of unfolding; so difficult is it in this, as well as in other instances, to appropriate to oneself what seems to be the common inheritance of the human race."

The above quotation cannot fail to suggest, to the mind of every reader, that the applicability of mental

philosophy, as a means of education, will depend rather upon the capacity and tact of the instructor than upon the age or qualifications of the pupil. The rudiments, like those of other things, may be conveyed, I believe, to most children, through the judicious employment of familiar illustrations; and may be made to excite interest, and curiosity, in a sufficient degree to produce endeavours after more extended and more satisfactory knowledge.

The time that is devoted to *reading*, of whatever kind, may be included in the hours of study; for, although reading may be practised with no better object than to find amusement, it should, even then, afford some instruction.

The books that are commonly read may be divided, perhaps, into three classes: the first, including such as are studied for the sake of the knowledge which may be gained from them; the second, such as combine instruction with amusement, and are read from feelings of curiosity; and the third, such as appeal, chiefly or entirely, to the imagination and the passions.

Of the first class, the utility will greatly depend, it must be evident, upon the degree of attention with which they are perused. The habit of the reader, and the nature of the subject, will both be important elements in determining the degree that is required; but it may be considered as an invariable rule that each of the natural sections or divisions of any treatise should be thoroughly mastered, before the next is proceeded with. The best test of this mastery is to be found, perhaps, in an endeavour to write out in a

condensed form, the argument, or essential part, of the work; doing this after it has been laid aside for a day, and then comparing the new version with the original. If no material point be omitted, and no surplusage introduced, the reader may be quite satisfied with the result of his labour.

It is not the least recommendation of the above method that it affords, indirectly, admirable exercises in the art of writing. The student puts down what he knows; and thus, not only obtains a statement of his acquired ideas, but also the power of expressing them with facility. He learns, or should learn, to avoid prolixity; and to compress his subject matter into the smallest possible space. Above all, he learns to be exact, and to know the points on which he is deficient in this respect. On all these accounts, the value of his work should be estimated by its quality, rather than its quantity; and a habit of performing it thoroughly should be the first object that is aimed at.

The time that may be given to hard mental work of this kind should always be determined by experiment; and the least sluggishness, or confusion, of thought should give the signal for rest, either for a few minutes only, or for a longer interval. Some persons are of opinion that obscure books, or passages demanding unusual reflection, should be read, at first, for the memory alone, and then pondered over during the intervals of rest. I would, however, recommend a contrary course; and that a difficult author should be always comprehended, not only sentence by sentence, but word by word. To postpone a difficulty is

always unadvisable ; and is no better in an intellectual, than a moral point of view : while, on all accounts, the brain should be suffered to rest, unless when actively employed. It may often be necessary to close the book in order to think ; but this is very different from skimming the difficult parts, and trusting to the future for their comprehension.

The books which combine, in various proportions, instruction with amusement, and contain facts in a framework of agreeable narrative, are both numerous and popular ; nearly all histories, biographies, voyages, travels, essays, and superficial scientific treatises, having, more or less, this character. Such works are often deceptive, because it is thought meritorious and intellectual to read them ; while they are read for their husks, more frequently than for their grain. The anecdotes of history or travel, and the jokes of biography, are the only portions that many readers can remember ; and the lessons which the general narrative should convey, or the reflections that it is calculated to suggest, may, very easily, altogether escape notice. It is always desirable to ascertain from children, through their conversation, what parts of a book have attracted their attention, and have sunk into their memories ; so that, in case of need, they may be guided to those portions, which are, in reality, most worthy of being retained.

It is under the fascinating influence of works of the class now under consideration that children, whether of smaller or of larger growth, are likely to fall into the great error of indiscriminate and heterogeneous reading. Certain books are talked about in

general society, are procured, skimmed, and half forgotten, all in the course of a few days; although they may deal with subjects which are far removed from the knowledge or comprehension of any but a few studious men. In this way is obtained that smattering of many subjects that appears upon the surface of ordinary conversation; and that is so often taken to constitute a "well-informed person;" the interpretation of which phrase is, in its ordinary sense, a person who is only a little wrong about everything. It need hardly be shown how this system ministers to inexactness, both of facts, and in conclusions; nor how it fosters that large section of the community who, with knowledge derived from 'Pinnock's Catechisms,' or the 'Penny Magazine,' are ready to say "I should think," upon every question that is brought before them.¹

It would be hard to say that works of pure fiction, as regards the young, are altogether injurious in their tendency; but still their total withdrawal would pro-

¹ There are few people who have not read the graphic account of little Paul Dombey's intellectual perplexities:—"When poor Paul had spelt out number two, he found he had no idea of number one; fragments whereof afterwards obtruded themselves into number three, which slid into number four, which grafted itself on to number two. So that whether twenty Romuluses made a Remus, or *hic hæc hoc* was troy weight, or a verb always agreed with an ancient Briton, or three times four was Taurus a bull, were open questions with him." Confusion such as this is, it may be hoped, exceptional; but a state of mind not altogether unlike it has been produced, in many people, by blending together the several matters treated of in such books as 'Vestiges of the Natural History of Creation' or 'The Plurality of Worlds.'

bably effect more good than harm. It will be difficult to find a better illustration of complete automatic attention than is constantly furnished by a child with a novel; and this attention, interfering, as it does, with volitional fixation of the thoughts, is not at all to be desired. The strong emotions too, which, in a susceptible mind, may be called forth by fiction, and, especially, by accounts of situations to which the events of daily life afford no parallel, are often hurtful; and good novels may serve only to excite a craving, which, with an immature judgment, bad ones will be sufficient to satisfy.

Perhaps the best means of encountering an evil that cannot be avoided, and of removing the sting from fictitious literature, is to direct attention to style, and manner of composition; taking the very best works, such for instance as "Ivanhoe," as models in these respects; and guiding the mind to a perception of those latent beauties and perfections which, from the very interest of the plot, might at first be disregarded. I believe it possible so to cultivate the taste, by proceeding in this way, that romancists, who convert a peasant into a prince in three volumes of bad English and false metaphor, will speedily lose their charm, even for the very young; and, once rendered ridiculous in their eyes, will neither corrupt their morals, nor harden their hearts.

The subdivisions of fiction, such as poetry, romance, and drama, do not require any separate or individual notice. With all of them it should be an aim to fix the mind of the reader upon certain definite points; and to read with a purpose: examining, and perhaps

admiring, the composition ; but not blind to its faults, nor entranced by its beauties. In all, the judgment should find materials upon which it may be exercised ; something to compare with the events of life, or with the operations of the intellect ; and some distinct grounds for criticism, whether favorable or adverse. If these be wanting in the book, the book itself is worthless ; if they be neglected by the reader, the reading scarcely can be beneficial.

Books which deal, in any shape or way, with the great questions of religion, form a distinct class by themselves ; and a class admitting of so many subdivisions that it is no easy task to speak of them collectively. There are, perhaps, three of these subdivisions that will include nearly all the rest.

The first contains all compositions which profess to inculcate, either by argument or precept, the duties of Christianity. Sermons, and many grave books of various kinds, together with much that is reprehensible, may be considered under the above general denomination.

Of such works, it may almost be said that they challenge, more or less, comparison with the Bible. They profess to be commentaries upon it, or expansions of it, or additions to it ; but they occupy the time that might be spent in its perusal, and they are directed towards the same apparent purpose. They should, therefore, I think, be guided by such piety and discretion, and composed in such a manner, as to render them, when the absence of inspiration, and the consequent absence of authority, are considered, not wholly unworthy of the original which they fain

would imitate. There are many authors whose writings will bear this test; and whose readers can scarcely fail to be better and wiser for their study. But there are hundreds of "good books,"—some containing vapid truisms and shallow sophistries intended to meet the prejudices of all parties—some addressed to sects, and bearing on every page certain watchwords of party, and certain technical peculiarities; others, last but not least, uttering furious denunciations of the wrath to come, or detailing "incoherent biographies of sickly or delirious children:" of all which it would be hard to calculate the mischief that they do. Let those who desire to estimate them at their true value adopt the test which I have indicated. Compare them with the Bible. Compare them with the letters of Paul; with the prophecies of Isaiah; with the narrative of the Evangelists.

Next in order will come controversial divinity, a subject which cannot altogether be excluded from the minds of children; and which, as it is sure to enter, should be made to enter under the most favorable circumstances. It should be early taught that "the Gospel is not addressed to us as weak and credulous beings, incapable of discerning between what is worthy or unworthy of God to promulgate, or of man to receive."¹ It should be taught also that the discernment with which we are gifted should be exercised as a sacred trust, in an humble, thoughtful, and earnest spirit; with a judgment inclining towards leniency with regard to others,—towards severity

¹ Van Mildert's 'Sermons.'

with regard to ourselves. Matters of such grave import to our present and our future welfare should not be profaned in familiar discourse, or interwoven with idle fiction. Children trained to think thus will be prepared, when their minds are sufficiently matured, to verify for themselves the truths which they have been taught; and to bring reason into unison with faith. They will avoid, like a pestilence, the trashy novels in which young misses discuss theology with their cousins or lovers; and in which the plot is so devised as to bring the characters, at the same moment, to the goal of matrimony, and the Rock of Truth. They will be likely to divest their opinions of the bitterness which so often clings to them; and, having experienced the difficulty of deciding for themselves, they will shrink from the responsibility of deciding also for their neighbours.

The third subdivision of religious literature will include works which appeal chiefly to the emotions; and to these works, whether in prose or poetry, I should scarcely be disposed to extend toleration. Often combining every charm of thought and diction, they exercise over the mind an influence inexpressibly seductive, awakening vivid feelings, producing beatific visions, shaping the train of thought into harmony with their dominant idea; until, the influence of the emotion they have aroused being thus exhausted, the world again steps in, and the cares and trials of to-day once more engross the attention, and occupy the thoughts. Such books are often too delightful to be left for prosaic occupation; and those who read them often fancy that, in the enjoyment of an exqui-

site luxury, they are performing a solemn duty. From this delusion it may be very hard to awaken them ; and they may fall into habits of self-consciousness which, sooner or later, must produce an effect to be deplored.

Among the Accomplishments that ordinarily form part of an educational scheme, there are only two, Music and Drawing, that require especial notice.

The study of Music, in one or other of its branches, occupies so much of the time devoted to the education of girls, that the importance of correctly estimating the influence which it exerts, whether upon body or mind, can hardly be overstated ; more especially as the extent and nature of this influence has been regarded, by different writers, from very different points of view.

The right appreciation of musical tones appears to be effected, almost entirely, through the agency of the sensorium ; and, although attention may greatly increase the power of distinguishing between them, yet original differences, the result of conformation, far exceed, in importance and extent, the differences that are acquired. It follows that the sedulous cultivation of musical taste or talent, while insuring improvement in the sensory organ, does not exert, of necessity, any good influence upon the judgment, or upon the higher faculties of the mind ; which powers, moreover, are certain to be injured by neglect. Learning to play upon an instrument may be regarded as an exercise of mechanical dexterity, and of sensorial acuteness ; but not as a means of mental education ; and therefore,

unless with reasonable hope of great proficiency, the time often devoted to practising should be much curtailed. Indeed, when it is considered how few of the many girls who learn music avail themselves of their knowledge in after life, this time deserves very serious consideration: and parents should think, not only of what is, but of what might be, accomplished within its limits.

I have heard it maintained, by many persons, that music is a natural language, calculated to excite definite ideas; and always actually producing them, in the minds of cultivated persons. For this opinion there is no better authority, that I am aware of, than the poetical license taken by Dryden, in 'Alexander's Feast;' a license which will admit of another, and a more sufficient, explanation. To conceive that any sensation (not produced by some simple quality of matter) shall at once certainly excite a particular idea, is opposed to all that we know of the operations of the mind; and cannot be maintained as an abstract proposition. Much less can it be maintained with respect to a musical sound: a sensation that many people are unable to distinguish from other sounds bearing some resemblance to it; but having, upon the language hypothesis, other proper ideas attached to them. In short, the ideas which we connect with music, like those which we connect with words, have no firmer link to the sound than that which is furnished by association and practice; and, just as a French child associates an idea of high temperature with the word *chaleur*, and an English child the same idea with the word *heat*, so people differently circumstanced will

associate different ideas with the same tone, or the same idea with different tones. But as, when a word is used only in a single sense, those who use it say, and feel, that it is particularly *expressive*; because, by constant practice, one idea, and that one idea alone, has been connected with it; so, in a civilized community, a particular interpretation of musical tones becomes sanctioned by custom, and is said to be their meaning. The first notes of a ballad inform the hearer whether it will be warlike or pathetic; and the more extended the knowledge of music, that is to say, the knowledge of the sense in which different combinations have been formerly employed, the more ready will be the perception of the intention and thoughts of the composer. Beyond this there can be no language in music; and no meaning, of any kind, attaching to variations of sound.

It has been said, by several medical writers of repute, that music exercises, upon the nervous system, some subtle and peculiar influence; and, in tracing hysterical and other disorders to its operation, they have appeared to think this influence mysterious or inscrutable. With this view I cannot coincide.

In the first place, the diligent performance of exercises upon a musical instrument, by concentrating attention upon sensory impressions, and by accustoming the muscles to consensual action, has a direct tendency to impair the power of the will, and to liberate the whole system from its sway.

Next, the emotional character of the words and ideas with which music is commonly connected, necessarily imparts a somewhat similar tone to the

mind itself, and keeps the feelings habitually active. They are seldom called forth in a painful, or even in a very evident degree; but, for many hours, perhaps, in every day, an emotional under-current of thought is excited and maintained; working itself off, generally, in the production of kindred ideas.

By these means, the study of music, when not made an intellectual pursuit, but limited to facile reading and brilliant execution, may become extremely mischievous. In order to guard against its injurious effects, it is prudent, where there is no great promise from its cultivation, to limit very strictly the time that is devoted to it; and, where there appears to be natural musical talent, to elevate, as far as possible, the *manner* of learning; judiciously employing the principles of acoustics and of composition; substituting, in some degree, the comprehension of a science for the mere practice of an art; and educating the intellect, as well as the ear and the fingers.

The art of Drawing, in all its branches, and more especially the art of drawing from life, exerts a favorable influence upon the mind, by assisting, indirectly, in the formation of habits of exactness. It leads, at least, to a correct appreciation of form, and size, and distance; and to a more close observation of the visible qualities of objects than can, without its assistance, be obtained. On all these accounts, it should hold, as a means of education, a far higher place than is commonly accorded to it; and, unlike Music, it should be taught to, and practised by, those children who appear to be deficient in natural talent for it. To them it may frequently compen-

sate, in some degree, for an inherent weakness or deficiency.

Of other accomplishments there is little to be said ; and that little may be deduced from the principles which have been already laid down. Fancy work, in all its varieties, may be either used or abused ; performed in a right way, or in a wrong. It may be made to improve the taste and the intellect, by designing ; or to exercise only the eye and hand, by copying. In the latter case the thoughts are left to follow their own course ; and there is, generally, just so much attention bestowed upon the work as may suffice to prevent any application of the mind to profitable matters. This, however, is not the fault of the occupation, but of those who work at it ; and even crochet, which has been stigmatised, with some appearance of justice, as “an invention of the devil,” would cease to be hurtful, if ladies would take the trouble to acquaint themselves with the effect that each variety of stitch produces upon the fabric ; and would then originate their patterns, instead of copying them, with Chinese fidelity, from halfpenny pamphlets or twelfth-rate newspapers.

Finally, in all pursuits, of whatever importance, of whatever character, the choice indicated in the last paragraph will rest with those who teach and follow them. In all, the mind may be exercised to its good ; just as the humblest ministrations of mercy to our fellows may be so wrought as to conduce to the glory of God. In all, by the instinctive operations of the inferior nervous centres, the desired result may be barely produced ; as, in the moral world, deeds of so-

called charity may be felt no farther than in their immediate effects. Powers and opportunities, like the light of the sun, are afforded, under somewhat different conditions, to all ; and each man must determine for himself whether to use, to squander, or to neglect them. Many may determine also, whether their children shall be early taught the importance of the decision that awaits them ; and whether they shall be guided, by precept and example, towards the best exercise of those talents for which, when we are all contemporaries, God will bring us into judgment.

THE END.

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